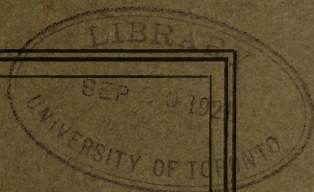


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THE AGRICULTURAL GAZETTE OF CANADA

Vol. VIII

September-October, 1921

No. 5

STORAGE

LEADING TOPICS

Canada's Case Against the British Cattle Embargo

Veterinary Biological Products

Inspection of Canadian Fruit

Motion Pictures in Agricultural Instruction

Agricultural College Extension

Agricultural Education in Canada

Cereal Crops of 1921

DEPARTMENT OF AGRICULTURE
OTTAWA, CANADA

The Agricultural Gazette is the official organ of the Department of Agriculture of Canada

The chief function of The Gazette is to promote and give publicity to the work performed in the interest of Agriculture and Agricultural Education by Departments of Agriculture, both Dominion and Provincial.

The Press is at liberty to reprint any of the articles appearing herein.

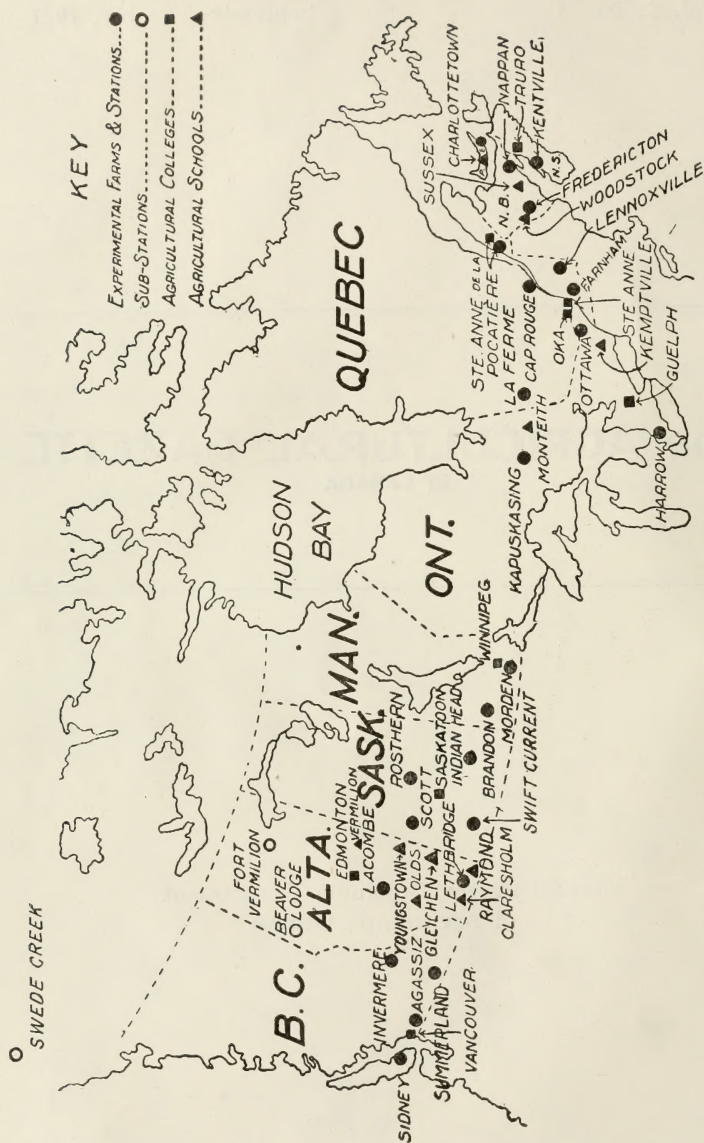
Vol. 8: No. 5

September-October, 1921

The AGRICULTURAL GAZETTE

OF CANADA

Issued by the Dominion Department
of Agriculture, Ottawa



MAP OF CANADA SHOWING THE LOCATION OF FARMS, STATIONS AND SUB-STATIONS IN THE EXPERIMENTAL FARMS SYSTEM, THE AGRICULTURAL COLLEGES AND AGRICULTURAL SCHOOLS

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The AGRICULTURAL GAZETTE

OF CANADA

VOL. VIII

SEPTEMBER-OCTOBER, 1921

No. 5

THE AGRICULTURAL GAZETTE of Canada is published bi-monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 20 cents per copy.

Subscriptions should be forwarded to the Editor, Agricultural Gazette, Ottawa.

J. B. SPENCER, B.S.A., Director of Publicity.

THE CANADIAN CASE AGAINST THE BRITISH CATTLE EMBARGO

Presented by the Honourable S. F. Tolmie, Minister of Agriculture, before
the Royal Commission of Inquiry on the Cattle Embargo in
Great Britain

IN presenting the case for Canada before the Royal Commission of Inquiry on the Cattle Embargo it is desired to express appreciation for this and other opportunities of urging, on behalf of the Government of Canada, redress of what the Dominion believes is an injustice. For many years the Government of Canada has protested against the maintenance of this embargo.

Until the cattle embargo was enforced Canadians enjoyed the privilege of shipping store cattle to Great Britain. Shipments were prohibited, however, after the imposition of the embargo, on the assumption that contagious pleuro-pneumonia had been discovered in a consignment of Canadian cattle landed in Great Britain. At that time the diagnosis of the British official veterinarians was stoutly denied by Canadians and also by prominent British Veterinarians, and the fact that not a single case of contagious pleuro-pneumonia has occurred in Canada, at that time or later, is an indication that the diagnosis made by the official veterinarians was incorrect, and that a grave injustice was done to the cattle breeders of Canada.

Canada, at the present time, claims that her herds of cattle are as free from disease as are those of any country in the world.

As disease possibilities from Canadian cattle, imported into Great Britain, have been so freely discussed of late, it will be in order to give a brief outline of the organization responsible for the health of Canadian live stock.

The Health of Animals Branch of the Dominion Department of Agriculture consists of a Veterinary Director General, who has charge of the work of the Branch, assisted by an Assistant Veterinary Director General and an adequate staff of qualified Veterinary Inspectors, and these inspectors must be graduates of an approved veterinary college and, in addition, must pass a qualifying examination before being accepted to carry on the work of the branch.

In addition, and in conjunction with the Branch, research and biological laboratories are maintained. A line of inspection and quarantine stations extends along the American border from the Atlantic to the Pacific. The entry of animals from the United States is limited to certain ports so as to facilitate complete control of the work. The quarantine stations are fully equipped with the necessary buildings and appliances so that a thorough examination of animals entering Canada may be made. The staff maintained in connection with the research activities of the Branch, as well as the staff of the Branch generally, is adequate for the prompt handling of any outbreaks of disease and can be promptly added to in the event of extraordinary measures being necessary.

It is interesting to note that in Great Britain, when speaking of the boundary line between Canada and the United States, it is usual to refer to it as a line 4,000 miles in length. This is not quite correct. As a matter of fact the line is 3,900 miles long, 1,700 miles of which are deep waterways which act as a natural barrier to livestock, and several hundred miles of the remaining 2,200 are situated in mountainous country and are not accessible to domestic animals.

Inspectors of the Health of Animals Branch are permanently stationed at various points along the American boundary and cover all ports of entry eligible for the entry of live stock.

There is no record of an outbreak of Foot-and-Mouth disease within the boundaries of Canada. The last appearance of Foot-and-Mouth disease on Canadian shores occurred thirty-seven years ago. One was in a shipment of cattle arriving on May 4, 1884, at Point Levis Quarantine Station, Quebec, on the ss. *Mississippi*. Another consignment arrived on June 7, of the same year at the same station, on the ss. *Oxenholme*. These are the last records

of Foot-and-Mouth disease in Canada, and, strangely enough, both consignments came from Great Britain. The animals in the shipment above referred to were all dealt with at Point Levis Quarantine Station, and, as pointed out above, the disease did not get a footing in Canada.

Previous to 1892 serious outbreaks of contagious pleuro-pneumonia have occurred in the United States. Outbreaks of Foot-and-Mouth disease have also occurred in that country in 1870, 1884, 1902, 1908 and 1914, and not a single case of either disease has ever occurred in Canada as a result of these American outbreaks. This is a proof that Canada is quite capable of protecting her boundary against contagious diseases occurring in the United States. The possibility of contagious disease of animals reaching Great Britain from the United States through Canada is extremely remote. In the first place all animals are given a close inspection when crossing into Canada by qualified representatives of the Health of Animals Branch. Supposing that it was even possible to escape detection at the boundary line, the disease would then appear among Canadian herds and be properly dealt with by the Field Division of the Health of Animals Branch.

Then before the animals are placed on shipboard a last close examination is made, and in addition there is the length of time required from point of origin to destination, which would be sufficient under ordinary conditions to cover the period of incubation of nearly all the contagious diseases that we might fear, so that from a practical standpoint no alarm need be manifested in this regard.

I may say that the Health of Animals Branch, during recent years, has been very much improved, and is more efficient to-day than ever before. Some doubt seems to exist in the minds of some prominent men in Great Britain

that Canada is able to protect this boundary, but the fact that Canada has successfully protected it on so many occasions in the past, and is protecting it now, should satisfy everyone as to her ability to do so.

Rinderpest, or cattle plague, has never existed in Canada. Outbreaks of Anthrax are rare and only occur as limited outbreaks, and are promptly dealt with.

Cattle mange, which was found in a limited area in Alberta and Saskatchewan, has now been practically eliminated. There is no longer any blanket quarantined mange area in Canada. Only a few farms in one province are under quarantine for suspected mange.

In the event of stocker cattle being shipped to Great Britain, no shipments would be permitted from the farms under quarantine, in fact, heavy penalties are levied under the Contagious Diseases Act for the removal of animals from a quarantined area without a license. I am informed, however, that cattle mange is not considered of sufficient importance in Great Britain to be scheduled as a contagious disease.

Should the embargo on Canadian cattle be lifted, Canada is ready to adopt such measures as will ensure the permanent identifications of cattle imported to Canada from other countries and thus remove any possibility of foreign cattle finding their way to Great Britain as Canadian stores. This would be a simple matter to arrange. On account of the excellent health record of Canadian cattle it would not be difficult to formulate importation regulations in Great Britain on a freedom from disease basis that would ensure entry for Canadian stores without permitting cattle from other countries which do not possess so good a bill of health as Canada, from taking advantage of the lifting of the embargo.

While the measures adopted by Canada for the protection of her bound-

dary have proven adequate in the past, the Canadian Government is quite willing to discuss any further reasonable measures for its protection that may be suggested by the British Government, in the event of the embargo being lifted.

Canada frequently imports pedigreed cattle from Great Britain, where "Foot-and-Mouth" outbreaks are not infrequent, twenty-four outbreaks having occurred in Great Britain during the year 1920. These cattle are imported under certain regulations imposed by the Canadian Government, and these importations have been made without exposing Canadian cattle to infection. If it is possible for Canada to import these breeding cattle from Britain with safety it is difficult for Canadians to understand why it should be dangerous for store cattle to be imported into Great Britain from Canada, where Foot-and-Mouth disease has not existed for thirty-seven years, and then only in a quarantine station.

As a further guarantee of protecting Great Britain against disease, the Canadian Government is willing to have an export inspection made by capable officers of all store cattle shipped from her ports to Great Britain, and to forward with each shipment a certificate showing that inspection has been regularly made.

Canadian store cattle can be shipped to the United States, France, Belgium, Switzerland, and Germany, and the healthy condition of Canadian cattle is generally admitted in the countries to which shipments have been made and great surprise is expressed at the refusal of the Mother Country to grant a similar privilege.

It is particularly noted that, owing to the exceptionally and indeed historically healthy condition of our stock, Canadian cattle are admitted to France without slaughter, and it is quite apparent that France is quite satisfied with Canada's ability to protect her herds.

It should be observed that, since placing the embargo, over three million head of Canadian cattle have been slaughtered under inspection at British ports and no case of Pleuro-Pneumonia or Foot-and-Mouth disease has been discovered.

In addition, we wish to quote some of the pronouncements of the British Ministers of Agriculture and other officials.

Mr. Prothero, then President of the Board of Agriculture, speaking before the Imperial War Conference, April 26, 1917, said:—

“I also believe that at the present moment and for many years past, as far as I can make out, Canada has been free from the disease, and on these grounds, therefore, we should receive the present suggestion for the removal of the embargo very sympathetically. We do not believe that there is now, or has been for a good many years past, the slightest ground to exclude Canadian cattle on the score of disease.”

Confirming this view, the Board of Agriculture on Saturday, July 26, 1919, issued a statement, which was quoted in the *Times* issue of July 28, and in which the following paragraph appears:—

“It is admitted by the Board of Agriculture that the bar to the importation of Canadian stores can no longer be maintained on the score of health. For many years cattle born and bred in Canada have been exceptionally free from all forms of infectious disease—indeed there are probably no cattle in the world which can show so clean a bill of health. Even the possibility of the introduction of infection through cattle which somehow or other had crossed the long line frontier between Canada and the United

States could be dismissed, because suitable precautions could undoubtedly be taken to ensure that any imports allowed were cattle that have been born and bred in Canada, and were leaving it for the first time for direct shipment to a British port.”

On January 12, 1921, Lord Lee, Minister of Agriculture and Fisheries, in further support of this pronouncement, stated, according to the Ministry of Agriculture Bulletin, February, 1921, to the Joint Parliamentary Committee of the Co-operative Congress which waited on him, that the Ministry had publicly endorsed the clean bill of health to which Canadian cattle were entitled.

In consideration of this official view, which was first advanced by a responsible minister of the Crown in 1917, was publicly reaffirmed by the Ministry in 1919, and was again confirmed by the succeeding Minister in 1921, the Canadian Government is of the opinion that further argument is unnecessary and that it is justified in assuming that under the circumstances in which this opinion was given, it should meet every fear of the British people as to the risks involved.

It has been suggested that it would be impracticable to admit Canadian cattle and exclude those from other countries. Lord Lee apparently took this view in that, while admitting the health of Canadian cattle, he contended that Canada was not the only exporting country and that if legislation were proposed it would be impracticable to limit its operation to Canada alone. We are informed that in so far as home control is concerned the Irish Department of Agriculture is in practically the same position in Ireland in relation to the Mother Country as the Department of Agriculture in Canada and we feel that as Canadians we have, under the circumstances, the right to expect equal treatment.

That there need be no obligations felt toward foreign countries in connection with the admission of Canadian stores was clearly set forth by Lord Onslow, President of the Board of Agriculture, in his reply to a delegation which waited on him on October 15, 1903. Lord Onslow said:

"But there is one point at any rate which I would like to clear out of the way. I think reference was made to it by more than one speaker, and that is that there might be some difficulty in connection with the treaties which this country is under obligation to with foreign countries. I say at once, without the slightest hesitation, that, so far as any commercial arrangements or arrangements in connection with the importation of cattle or the exclusion of disease is concerned, we will not consent to be in any way overruled or under any obligation to foreign countries. So far as our colonies are concerned, we intend to keep absolute freedom to do what we like within the British Empire."

The presentation of the Canadian case is designed to show that there is not now and indeed never has been ground for the exclusion of Canadian cattle because of disease prevailing in Canadian stock and that such exclusion originating in allegation of such disease and continued in the same form through all these twenty-nine years has cast an implication upon Canadian cattle which has seriously affected the Canadian cattle trade and has thus constituted a grave and wholly indefensible injustice to the Dominion. It has been designed in part to show as well that only on the ground of protection from disease and not of protection from competition has such implication been maintained. It is true

that of recent years, as shown above, there have been on the part of British authorities frank admissions that the implication could no longer be sustained on the basis of a charge of disease against Canadian stock but the very fact that the embargo so originated and notwithstanding the unceasing protests of the Canadian Government throughout these years is still maintained constitutes a continuance of implication and a continuance of injustice. If the British people desire to protect their cattle industry by giving economic advantages to the home production that is the business of the British people.

While we desire to urge, as will be set out further on, that owing to the long and heavy freights, particularly on cattle transportation, such protection may not be considered necessary, we most definitely and strongly affirm that such protection cannot be justly or defensibly reached by the means now employed.

The continuity of the supply of store cattle to Great Britain will be better ensured with two sections of the Empire furnishing these animals (Ireland and Canada) than if you simply depend on one section, and we think it is safe to assume that more satisfactory prices to the feeder will ensue.

It is now desired to present certain considerations which, admittedly, are of moment, rather from the standpoint of the interests of the United Kingdom, economically and otherwise, than from the single standpoint of Canadian interests, and in making these representations we wish it distinctly understood that they are presented with complete deference to the undoubted right of the British Government to measure their importance and alone to decide as to their value. Certain of them, however, affect the broad question of inter-Imperial trade in which all parts of the Empire have vital interest.

The Argument that the Admission of Canadian Stores will put British Cow-keepers out of Business

This argument, as advanced by various farming interests, is in line with the position so strongly taken by the breeders of pure-bred cattle, notably by Lord Crewe, Lord Bledisloe and others, to the effect that a consistent policy of isolation is necessary to protect the interests of the British live stock industry as that industry is of such vital importance to the country as a whole. This view is quite distinct from the decision reached by Lord Brule in 1919, when he gave it as his considered opinion that while admitting the health of Canadian cattle the situation in the country districts was at that time in such an unsettled condition that the removal of the restrictions would prejudice the efforts which were being made to restore confidence in the minds of the farmers and would definitely jeopardize the future of the industry. It is quite apart also from the question of disease which although undoubtedly relevant in the minds of many farmers and breeders, ought, as Canada contends, to be considered on its own merits and in relation to the admission by the Ministry of Agriculture that the exclusion of Canadian cattle cannot longer be continued on the grounds of disease. Normal trading conditions have now been practically restored and, as the effect of supply and demand is again operative, consideration of the objection of farmers and breeders on the score of protection to their business is definitely identified with the fiscal policy of the country.

Naturally, this is a question in regard to which Canada must defer to whatever view may be taken by the British Government, except perhaps with respect to whatever arguments may properly be advanced in the interests of the Empire in any joint discussion of Imperial policy. It is very significant, however, that in the early years of this contro-

versy a particularly definite pronouncement as to the attitude of the Board of Agriculture toward a policy of protection was made by the Right Honourable the Earl of Carrington, President of the Board, to a deputation which waited on him on January 5, 1906. In his reply, after referring to a suggestion that the policy of the British Government had been dictated by the demand that British cattle breeders should be protected against cheap outside competition, Earl Carrington said:

"The subject, in my opinion, does not turn on that point at all. All that is absolutely beside the question. I cannot admit that that could possibly be allowed to be a reason for keeping Canadian or other stores out of the kingdom. I do not admit—I cannot admit, as Minister of Agriculture—that these restrictions are imposed to keep up the prices of store cattle in this country. If I thought so for a moment I would go to the Cabinet and do my best to have it done away with at once. . . . I do not admit that argument and I only take my stand on the risk, and the risk only, of the importation of possibly diseased cattle to the danger of the flocks and herds in the United Kingdom."

In the light of this pronouncement and in consideration of British trading policy generally, Canada has assumed that the British Government does not propose to place itself in the position of justifying the exclusion of Canadian cattle on the grounds of agrarian protection and that therefore the Dominion may very properly ask for consideration of the whole question from the standpoint of the economic advantages which it is firmly believed would accrue alike to the farming interests of both Canada and Great Britain, as well as to the great consuming population of the Mother Country.

Economic Advantages to the Mother Country

(a) *Canadian Output would be Increased.* The removal of the embargo would ensure, as would no other steps that could possibly be taken, a steadily increasing and readily available supply of beef from the Dominion nearest her own shores. The importance of this to the United Kingdom the British Government must itself determine. It will be recognized, however, that production is based on confidence in the market, and to obtain maximum production in Canada no other measure will prove of equal or more permanent effect.

(b) *Home Supply would be Augmented.* It will greatly augment the supply of home-killed meat. Great Britain is steadily falling behind in the proportion of beef killed within the country as compared with the tonnage of the product imported. The exact history of the trade is indicated by the following statistics which show the percentage of fresh killed beef, including foreign live stock, in relation to the total supply available for consumption:

1904	1908	1913	1918	1920
80%	76%	63%	67.5%	61.52%

That the percentage for 1918 was as high as it is, is due rather to the forced reduction of imported supplies than to any increase in the home-killed product, which, to be exact, was then actually less than in any year since the commencement of the dead meat business. On the other hand, the percentage in 1920 accurately represents the decreasing ability of Great Britain to supply her own needs and her growing dependence upon foreign sources of supply. This is natural, not only in view of the expanding population of the British Isles, but as well, because of the fact that dairy cattle must be maintained in larger and larger numbers to meet the steadily increasing requirements of milk. Dairy herds may be looked upon as a profitable and practicable source of

supply for veal but can never be regarded as offering any satisfactory provision toward meeting the need for feeding cattle. It has been the experience of all thickly populated and intensively cultivated countries that it is more profitable to produce milk than to rear store stock; hence it will be found that Great Britain must depend more and more largely upon cheaper outside sources of supply for her store cattle if she would follow the agricultural practice which will net the greatest returns to her farmers.

In this same connection an analysis of the export movement of fat and store cattle from Ireland to Great Britain is of interest:—

	Fat Cattle	Store Cattle
Average for 10 years		
1878-87.. . . .	264,190	353,350
1888-97.. . . .	272,725	369,249
1898-07.. . . .	263,755	468,197
1908-17.. . . .	339,627	405,260
Average for 5 years		
18.. . . .	405,023	371,647
Exported in 1918.. .	375,705	289,709
Calendar year 1919..	531,842	194,781
Nine months ended		
Sept. 30, 1920.. . .	326,108	272,917

The regular increase in the exportations of fat cattle as compared with the corresponding decrease in recent years of the supplies of store cattle is clearly suggestive of Ireland's present agricultural policy. Of this matter Lord Ernle, Ex-President of the Board of Agriculture and Fisheries, has the following to say:—

"Ireland is advancing most rapidly in its agricultural development. If we get cattle from Ireland they will increasingly come over here in the form of finished, fully-fed cattle. Therefore, the supply of Irish store cattle is likely to diminish."

That there is growing concern, particularly amongst feeders in certain areas, as regards the supply of young, vigorous, thrifty store stock is so well known as to require no comment. It is not for Canada to argue as to British agricul-

tural policy, but it may not be improper to say that with the increased cultivation of arable land and where market conditions, as in the United Kingdom, justify highly intensive management, experience has shown the practical advantage and profit in specializing in the finishing business rather than in continuing, to the usual extent, the breeding and rearing of store cattle. The United States, Canada, Ireland, and Great Britain herself have clearly demonstrated the truth of this deduction.

Recognizing the existing shortage of store cattle, Britain can, of course, continue her policy of exclusion and set herself to the task of producing larger numbers of stores upon her own farms. To do so, however, is clearly to diminish her capacity to finish a corresponding number of market cattle, and does not appear to be in accordance with the commercial cattle experience of the Corn Belt of America, or other great feeding areas of the world. On high-priced, intensively tilled land the turnover in the rearing of store cattle is too slow to be remunerative. The open spaces of Canada can land stores on the highly cultivated farms of Britain at less cost than these can produce them, both as regards maximum output in actual tonnage of beef and in profit to the individual farmer, and it is submitted that Britain will find it to her distinct advantage to co-operate with Canada in this matter rather than to attempt to depend wholly upon her own resources.

The problem of securing a sufficient number of stores from Ireland is now further complicated by the continued appearance of foot-and-mouth disease in that country and by the necessity of the Ministry of Agriculture declaring an embargo against the importation of Irish stores.

The suspension of supplies from Ireland was at once productive of an increase in the price of home-killed meat in England, the rise within a week being as much as 1-1/2d. per pound. The cri-

tical situation which has arisen well illustrates Britain's dependence upon Ireland and at the same time distinctly confirms the claim, made by all advocates of the removal of the restrictions, that the importation of Canadian feeding cattle would at once regulate, if not appreciably lower the price of home-killed meat to the British consumer.

On the other hand, British breeders or those engaged in the rearing of stores have little ground to fear Canadian competition, provided of course they do not insist upon an absolutely protected market but are willing to meet in reasonable degree the effect of supply and demand on the basis of the general movement of the world's meat business. Inasmuch as Great Britain can supply only about 60 per cent of her own requirements and in view of the fact that home-killed beef always commands a steady premium over the frozen and chilled product, British feeders will always be catering to an active market. The gravest competition which British feeders are called upon to face is undoubtedly that resulting from the huge imports of foreign beef, and British live stock interests would appear to be strengthening their own position rather than otherwise by taking whatever steps are possible to secure a larger control of their home business as a defence against the dominating position held to-day by those in control of the world's dead meat trade.

(c) *Supplementary Industries would be Affected Beneficially.* The removal of the embargo with the consequent importation of Canadian cattle will provide more work for British labour, will increase the domestic supply of leather, and will make it possible for the poorer classes to obtain at low prices much larger quantities of fresh offal, hearts, livers, heads, etc., than has been available since the discontinuation of the stocker cattle trade. These clearly are supplementary considerations, but they are of no mean importance in view, particularly, of the shortage of leather, of

the high cost and poor quality of frozen offal, and of the important advantage of extending every possible channel for the employment of labour, both by developing supplementary industries and by increasing supplies of raw materials. Unquestionably the profits from the trade in offal, fertilizer, and allied products, together with the control they exercise over the hide and leather business, constitute most important factors in the power of the United States meat dealers.

(d) *Trade in Pure-bred Stock would be Increased.* From the standpoint of British breeders of live stock perhaps the most important consideration is the fact that the removal of the embargo will unquestionably promote the importation by Canada of pure-bred live stock from the United Kingdom. On the other hand, the continuance of the embargo will decrease it. An extensive trade in stores will undoubtedly result in an increasing return trade in pure-bred bulls, of which Canada is all too short. The opening of the British market to Canadian cattle would give such a decided stimulus to the Canadian cattle industry as to set on foot a general movement to secure an improvement in the quality of the cattle stock of the country. Under such circumstances heavy annual purchases would continue to be made in Great Britain. Conversely, should the embargo be continued, Canada must endeavour by all means in her power to secure a permanent, unrestricted outlet for her surplus to the United States markets. Already this trade has resulted in the sale by American breeders to Western Canada of many high-priced cattle and other live stock. The future value of such a trade is already recognized in the United States, and it is clear that this business would prove of considerable significance in any trade negotiations which may be undertaken. It would be unfortunate from many points of view should Canada be forced into a commercial ar-

rangement which would prove of disadvantage to the Mother Country.

Trade in Sheep.—Similar arguments apply as regards the exportation of live sheep. It is not anticipated that were the embargo removed this trade would reach large dimensions. Canada has, all told, about 3,000,000 sheep, and, is not reckoned as an important sheep raising country. On the other hand, to ensure any progress whatever it is essential that a permanent export outlet be found to absorb the annual surplus. Canadians are not heavy consumers of mutton, consequently a surplus of lambs, particularly during the fall months, is regularly met with. The United States has usually absorbed this, but again owing to the unstable trade relations between the two countries, this outlet may at any time be closed to the Dominion. Should this occur, the Canadian sheep industry, lacking an alternative outlet, would dwindle to insignificant proportions. To safeguard this situation Canada is seeking a permanent market elsewhere. The fact that the surplus during the fall months, as in the case of cattle, is largely of unfinished stock emphasizes the need that this outlet be for live sheep. If such a market can be secured it will steady market prices during the heavy fall runs and will do more to inspire confidence amongst producers thus stimulating production than would any other measure that could be adopted. It is known that English and Scotch feeders would welcome the opportunity of again being enabled to handle Canadian store sheep.

Economic Advantages to Canada

(a) *Export Outlet Necessary.*—Canada has annually a large surplus of heavy partially finished cattle which is not readily absorbed by the domestic trade and for which she must secure export outlet. In 1914 she exported to the United States 206,446 head of cattle; in 1915, 183,672 head; in 1916, 227,202 head; in 1917, 164,169 head; in 1918,

189,229; in 1919, 532,309 head; in 1920, 311,070 head. This heavy exportation was carried on despite urgent and partially successful measures undertaken by the Federal Department to promote and extend the return of store cattle to farmers for finishing purposes.

As the United States market is uncertain and, in view of the tariff measures which have now become law in the United States, a permanent export outlet to take care of this surplus is essential. Otherwise the raising of cattle will diminish and the whole cattle industry suffer. Given such an outlet, however, the finishing of cattle within the country to the extent to which conditions will permit will steadily increase as the Dominion develops.

The reason for this will be better understood when it is explained that, owing to climatic conditions, to the shortage of labour, and to the sparsely settled and partially developed condition of the country, Canada can produce and rear a much larger number of store cattle than she can feed and finish. The more effective the effort to extend cattle production the more, meanwhile, will this condition be emphasized. This fact was clearly demonstrated by the experience of the war. Canada, therefore,

must seek a practicable outlet for her store cattle, either in the United States, Great Britain or elsewhere or the confidence of her farmers in the industry cannot be maintained.

(b) *An Alternative Market.*—Canada is earnestly seeking an alternative market to better secure the independence of her producers. In this regard the interests of the Dominion and of the Mother Country are identical. The more fresh beef which can be produced within the United Kingdom the less will British trade be under the domination of the foreign meat interests. As we shall show later, the importation of Canadian stores, if systematically carried on, will considerably and economically augment the supply of home-killed beef. To this extent, then, will the independence of both countries be strengthened.

(c) *Movement Commercially Practicable.*—The margin upon which Canadian producers would have to rely in selling stores to Britain is indicated by the fact that both stores and fat cattle in the United Kingdom are worth practically half as much again as they are in Canada. The following table showing the average wholesale prices per pound makes clear the difference in value between home-killed and imported meat:—

	Home-grown	New Zealand	Australia	South American Chilled	South American Frozen
1914.	7½d.	47½d.	42½d.	41½d.	47½d.
1915.	9½d.	69½d.	6½d.	6½d.	6d.
1920.	16d.	10d.	8½d.	10½d.	10½d.

A comparison of Canadian with British markets and a careful analysis of the history of the trade determine two facts (1) the margin between prices paid in the two countries is such, freight differential considered, as to make possible commercial movement from Canada to Britain; (2) live cattle values, as compared with dead meat prices, indicate the advantage to Canada of securing the outlet which will enable her cattle to qualify for the high-class trade in fresh-killed meat.

If this outlet is unavailable, and should the present market be closed to Canada, she would be forced to face competition with the Argentine for the whole of her product, on the basis of the lower chilled and frozen beef values. Again, as she always has a surplus of young and unfinished cattle for which no export outlet offered, she would be obliged to face serious gluts on the market at certain seasons of the year. Under these circumstances confidence amongst the farmers would be difficult

to maintain and the future of the beef cattle industry would be in a much less desirable position, and the different interests in the United States would benefit inasmuch as they would be able to purchase this meat at a cheap price when the run was on and ship it to Great Britain as frozen meat and at a substantial profit.

In view of the facts noted above, British interests will perhaps be better able to understand the practical reason why Canadians are endeavouring to secure admission for their store cattle in preference to the market which now exists for cattle landed for immediate slaughter. Canada at present has no well-recognized feeding grounds commensurate with her productive power and comparable to the Corn Belt of the United States or to the rich pastures of Scotland and England. The best commercial cattle that she can produce need from two to four months further intensive feeding under British conditions to give them the finish and flesh which will enable them to favourably compare with prime Scotch and English bullocks.

(d) *Possible Supplies from Canada.*
—British interests may properly ask for

a definite statement as to the supply of store cattle which may be expected from Canada annually in the event of the import restrictions being removed. The cattle population of the Dominion is in the neighbourhood of 10,000,000 head distributed by provinces as follows:—

Cattle Population—By Provinces

	1920
British Columbia.. . . .	154,972
Alberta.. . . .	1,355,941
Saskatchewan.. . . .	1,324,062
Manitoba.. . . .	757,974
Ontario.. . . .	2,881,827
Quebec.. . . .	2,132,212
New Brunswick.. . . .	332,988
Nova Scotia.. . . .	398,461
Prince Edward Island.. . . .	139,143
Canada.. . . .	9,477,580

A few store cattle may be drawn from all the provinces but the main source of supply is to be found in Western Ontario and in the three Prairie Provinces, particularly in the pasture areas of Southern Alberta and Southwestern Saskatchewan. A detailed statement of Canada's exports of live cattle and beef since 1890, with the view of accurately indicating the stability and extent of this trade, is given below:—

TOTAL EXPORT OF BEEF FROM CANADA TO THE UNDERMENTIONED COUNTRIES 1910-1920.

Year	United Kingdom Lbs.	United States Lbs.	Other Countries Lbs.	Total Lbs.	Total Value \$
1910.. . . .	824,140	48,503	441,754	1,318,397	109,993
1911.. . . .	482,371	1,957	490,083	974,411	91,844
1912.. . . .	274,419	5,711	668,641	948,711	86,596
1913.. . . .	782,920	19,474	768,585	1,570,979	135,111
1914.. . . .	190,787	12,772,291	654,629	13,617,707	1,127,911
1915.. . . .	1,330,482	17,697,917	642,302	19,670,701	1,988,489
1916.. . . .	13,912,771	9,456,290	*25,534,504	48,903,565	5,994,833
1917.. . . .	15,179,195	10,039,593	*20,327,388	45,546,176	5,750,435
1918.. . . .	32,768,400	12,672,602	*41,124,102	86,565,104	13,016,378
1919.. . . .	91,644,900	32,965,700	*1,192,300	125,802,700	26,594,814
1920.. . . .	28,730,500	34,418,000	*40,751,000	103,899,500	19,637,656

* 1916, France, 14,000,000 lbs.

* 1918, France, 40,000,000 lbs.

* 1920, France, not specified.

* 1917, France, 18,500,000 lbs.

* 1919, France, not specified.

THE AGRICULTURAL GAZETTE OF CANADA

EXPORTS OF LIVE CATTLE FROM CANADA TO THE UNDERMENTIONED COUNTRIES FROM 1890 TO 1920 INCLUSIVE (FISCAL YEARS)

Year	Great Britain No.	United States No.	Other Countries No.	Totals No.	Total Value \$
1890..	66,965	7,840	6,649	81,454	6,949,417
1891..	107,689	2,763	7,309	117,761	8,772,499
1892..	101,426	551	5,202	107,179	7,748,949
1893..	99,904	402	6,918	107,224	7,745,083
1894..	80,531	256	5,270	86,057	6,499,597
1895..	85,863	882	7,057	93,802	7,120,823
1896..	97,042	1,646	5,763	104,451	7,082,542
1897..	120,063	35,998	5,308	161,369	7,159,388
1898..	122,106	87,905	2,999	213,010	8,723,292
1899..	115,476	92,834	3,537	211,847	8,522,835
1900..	115,056	86,989	3,479	205,524	9,080,776
1901..	119,050	46,244	3,985	169,780	9,064,562
1902..	148,927	31,703	3,803	184,473	10,663,819
1903..	161,170	10,432	5,178	176,780	11,342,632
1904..	148,301	3,517	5,599	157,417	10,424,671
1905..	159,078	3,696	4,328	167,102	11,360,969
1906..	163,994	4,726	7,310	176,030	11,656,829
1907..	149,340	8,184	4,617	162,141	10,932,539
1908..	124,015	23,612	3,366	150,993	9,301,184
1909..	143,661	16,130	3,154	162,945	10,771,366
1910..	140,424	12,210	4,752	157,386	10,792,156
1911..	113,795	7,576	3,552	124,923	8,537,473
1912..	47,868	9,807	3,842	61,517	4,098,179
1913..	12,069	28,268	3,959	44,296	2,237,135
1914..	9,788	206,446	3,615	219,849	7,906,794
1915..	.....	183,672	2,252	185,924	9,267,534
1916..	1,752	227,202	12,581	241,535	12,625,760
1917..	.....	164,169	1,967	166,136	7,883,842
1918..	.....	189,229	2,130	191,359	14,136,944
1920..	479	500,216	*14,830	515,525	46,064,631
1919..	.....	308,562	2,934	311,496	30,069,490
Calendar year 1920..	.....	.....	.....	240,660	22,684,831

* 1916, France, 10,600.

*1920, France, not specified.

Canada can export under normal conditions, from 200,000 to 500,000 head of cattle per annum. The latter figure represents the maximum that could be forwarded overseas and would probably be reached only under particularly favourable conditions. With the United States market, however, closed against the Dominion, a range of from 200,000 to 400,000 can reasonably be depended upon, and as a cattle producer Canada is still in her infancy.

Conclusion

By way of conclusion, Canada fully appreciates that the British Government must take every necessary precaution to maintain confidence and safeguard the stability of the agricultural interests of Great Britain. The strategic importance of this policy is

well understood. Further, it is realized that at the root of all the opposition that exists to the removal of the restrictions lies a fear that whether from the risk of disease or the result of competition, the future of the live stock industry will be endangered. The question of disease has already been dealt with. As regards competition which would result in the demoralization of the market, British feeders or breeders should realize that such an eventuality would be as much a catastrophe to Canadian interests as to their own. The development or continuance of an import live cattle trade is absolutely dependent upon firm, steady prices and in this regard the interests of the Canadian and British producer are identical. On the other hand the breeders of store stock in the British Isles are always protected by the heavy transportation

cost in connection with the shipment of Canadian live cattle. This cost in the case of the forwarding of a steer from Calgary to Liverpool amounts at present to the equivalent of an import tax of 2½d. per pound. It is submitted that a trade which is naturally protected against outside competition by the equivalent of an import duty from 30 to 35 per cent of the value of the produce ought to be in a fair way to realize a reasonable profit on its investment. If Canadian producers can face such a handicap and still make a profit, it would seem that British consumers may have a definite interest in the situation looking to the regulation by outside competition of the cost of home killed beef. Canada cannot afford to produce or forward cattle unless assured of a reasonable profit over and above transportation cost, and any decline in British prices will be more quickly and effectively felt in the

Dominion than in the Mother Country. Under present conditions, however, Canada would find a definite advantage in shipping to the British market, and it is evident, therefore, that it is in the interests of the British consumer that she should do so. On the other hand British breeders possess a geographical protection which ensures them continuously such a workable margin of advantage as, under present conditions in relation to world movement of food products, should provide every reasonable confidence in the future of the industry.

The foregoing constitutes the case of Canada as from the beginning advanced and urged with greater insistence from year to year. We now wish to draw emphatic attention to the fact that the conclusiveness of this case has already been considered by the British authorities and a definite assurance given that the embargo would be removed.

PART I

Dominion Department of Agriculture

INSPECTION OF FRUIT FOR EXPORT AND INTER-PROVINCIAL TRADE

BY C. W. BAXTER, FRUIT COMMISSIONER

TWENTY-FIVE years ago Canada was in danger of losing her export apple trade owing to the high percentage of consignments received on the British markets showing large quantities of over-faced and improperly packed and graded fruit. It was felt that the unsatisfactory conditions governing the industry were due largely to the absence of any regulations governing the packing, grading and marking, thus making it impossible to place any reliance upon the grade marks appearing upon the barrels. While the lack of standardization was felt in all markets, the export and inter-provincial trade was particularly affected, a reliable system of grading being more important in the case of long distance than local shipments, where difference of opinion between shipper and consignee can be more easily adjusted.

As the returns to exporters were reflecting the lack of confidence felt by buyers in the United Kingdom, and as it was realized by those interested in the welfare of the industry that the trade could not be saved from retrogression without standardization, the more progressive growers and shippers requested legislation providing for compulsory grading and marking, and in 1901 the Fruit Marks Act was passed. The object of the Act was to raise the standard of the commercial pack of fruit in Canada, the improvement of the export trade being particularly in

the minds of those framing its provisions.

The administration of the Act was placed with the Department of Agriculture, and a staff of eight inspectors was charged with its enforcement. During the first few years of the operation of the Act, the inspection was confined almost entirely to the ports of export, and almost immediately a marked improvement in the grading and packing of the apples offered for export was noticeable. Even as early as the second season the satisfactory results of its enforcement were being commented upon in the United Kingdom, one large fruit broker writing under date January 10, 1903: "In reference to the packing of apples in barrels, there can be no doubt that the passing of the Fruit Marks Act (1901) has had a most beneficial effect in improving the grading and marking of fruit." References were also made to the Act in the British press, an article in the *Glasgow Herald* of December 29, 1902, reading in part: "Recent legislation in Canada has done much to remove complaints as to the marking of packages and of the quality of the fruit."

As the advantages of the inspection service became apparent, growers, shippers and dealers urged upon the Department the necessity for an extension of the work to include the principal distributing and consuming points in Canada and also to cover many other kinds

of fruit grown commercially in this country. Amendments have been made to the Act from time to time, prescribing grade marks, defining grades, standardizing packages, etc.

From 1901 to 1912 the work of inspection was confined practically to the docks at Montreal, St. John and Halifax, and to the large consuming centres such as Toronto, Winnipeg, Regina, Calgary, and Vancouver. The manner of inspection was to open and examine a number of packages from each lot, and if the fruit was not packed in accord-

run the risk of prosecution as the chances of detection were fairly remote, particularly in the case of export fruit, it being possible to inspect only a small percentage of the apples for export, owing to the speed with which these are loaded from the cars into the steamer's hold—the inspection being made on the dock as the loading was in process.

In 1913, therefore, some additional inspectors were appointed, and the work extended in certain sections to the shipping centres in the producing districts. The result of this change soon showed



Dominion Government Inspectors examining apples for export at docks in Montreal.

ance with the Act, a report was made to that effect and the packer prosecuted if, after thorough investigation, the facts warranted such action. While this method, which was the only practical one with the few inspectors on the staff, undoubtedly had a deterrent effect on packers and shippers who were anxious to avoid prosecution, it did not prevent the improperly packed and marked fruit reaching the market. Also in the case of the less reputable packers and shippers, there was a tendency to

a material improvement, and by 1914 this system of "inspection at point of shipment" had been adopted in all commercial fruit growing districts, and has been continued to date, so that this season practically the whole staff of over sixty inspectors are working among the growers and packers, not only inspecting the fruit after it has been packed, but giving instructions in the orchards and packing houses in the proper methods of picking, grading, packing and shipping fruit. Instead of waiting

to detect false packing or grading after it has been done, the inspectors to-day are spending their time and energy in preventing the evil, thereby protecting the grower from commercial and financial loss in marketing his fruit and, in addition, protecting the consumer, and establishing greater confidence in the trade. This is particularly valuable in the case of export and interprovincial shipments, as the inspectors endeavour to give special attention to all requests for the inspection of long distance shipments.

As the packing season is short, it is impossible for the inspectors to visit every orchard, and consequently a great many lots are inspected at the shipping station. If fruit is found not up to grade, the inspector at once communicates with the packer and requests him to examine the shipment, giving him a practical demonstration in grading; the packer, if circumstances warrant it, is then given an opportunity to reduce the grade before his fruit is shipped. If the grade is not lowered in accordance with the quality by the packer, the inspector may mark the words "Below Grade" on the package, or he may efface the false mark and place the proper grade mark thereon.

Of special value in the case of interprovincial shipments, particularly to the prairie markets, is an arrangement made the past few years by which officers of the Branch are authorized to give any shipper desiring it, a copy of the report referring to his fruit, which is often attached to the bill of lading by request of the consignee. Such a report does not vouch for the contents of the car, but for those packages only which have been actually inspected and marked with the inspector's stamp, but dealers have demonstrated their willingness to purchase cars on the strength of these reports.

Since 1918 the inspectors at such points as Vancouver, Winnipeg, Toronto, and Montreal have also been authorized

to inspect rejected cars, and give a report to the consignee or consignor as to the condition. In the past serious loss and waste of fruit and vegetables have been incurred through consignees refusing to accept cars, necessitating the re-consignment and possibly a second rejection or a forced acceptance at a greatly reduced price. The principal reason for undertaking the inspection of such cars was to facilitate prompt delivery, thus avoiding unnecessary waste of food. This service has also assisted materially in ensuring prompt settlement of disputes between shippers and consignees, and has proved particularly valuable in inter-provincial trade where, the disputing parties being a great distance apart, one or the other was very often at a disadvantage. The report of an impartial inspector has frequently been the means of effecting a prompt settlement.

Closely connected with the inspection of fruit for the inter-provincial and export trade, is the work done by the Transportation Division of the Fruit Branch. Experienced traffic men are stationed at several points in order to advise shippers as to the proper routing for long distance shipments; complaints of improper loading or handling of fruit in transit are investigated; methods of distribution are carefully studied with a view to recommending improvements. Improved methods of car loading are demonstrated, and assistance given in the work of experimental shipments and the testing of different types of cars. Work of this nature in connection with refrigerator car shipments from British Columbia to points in the prairie markets and East, were carried on during the season of 1920, with the co-operation of the Dairy and Cold Storage Branch. Fruit inspectors assisted in equipping the cars and accompanied them to their destination. Experimental work of a similar character is being carried on by the Fruit Branch this season (1921) from Ontario points.

While in the early fruit inspection days apples were the principal fruit dealt with, during the past few years all kinds of fruits grown commercially in Canada, and also some vegetables, have been inspected and, as noted above, special attention is given to long distance shipments. In British Columbia a large increase was made in the staff of temporary inspectors early in June to look

after strawberry shipments, as the berry industry on Vancouver Island and the lower mainland has developed rapidly during the past two or three years. As the result of the special service rendered by Dominion Fruit inspectors at the shipping points, carload shipments to the Prairie Provinces have been an unqualified success.

THE DOMINION EDUCATIONAL BUTTER SCORING CONTEST, 1921

THIS is the third year of the contest. In 1919 and 1920 four creameries from each province contributed a 14-pound sample each month from May to October inclusive. This year only one creamery from each province sends a sample every month for the same period, but a different creamery must compete each month. In this way, six creameries from each province will participate in the 1921 contest. The contest was half over when the July samples were scored on August 2. The quality of the butter for the first half is finer than previous years.

The highest score of any sample since the competition commenced in 1919 was given the 1921 July sample from the Edmonton, Alta., City Dairy, which scored 43 for flavour and a total of 98 points. The highest scoring sample in June was from Central Creameries, Calgary, Alta., with a score of 42.5 and 97.5. The highest scoring sample in May was from Shoal Lake Creamery, Shoal Lake, Man., with a score of 42.5 and 97.

The average of the scores of the May, June and July samples from each province is as follows:—

Province	Average Score for Flavour	Average Total Score
Manitoba.	42.3	96.7
Alberta.	41.8	96.7
Quebec.	41.1	96.0
Nova Scotia.	40.3	94.5
Saskatchewan.	40.3	94.3
British Columbia.	39.8	94.2
Ontario.	39.5	93.7
New Brunswick	*40.0	93.6
Prince Edward Island.	*40.0	93.3
*Average score for May and June samples only.		

The defects in the 25 samples received were as follows: Flavour, not quite fine 1, not clean 7. Texture, weak 4, open 1, greasy 8, brittle 4. Incorporation of moisture, free moisture 6. Colour, slightly uneven 10. Salting, too heavy 3. Packing, poorly finished 7. Average per cent salt added at churning, 2.37 pounds. Average per cent salt in the butter, 1.45. Average per cent moisture in the butter, 14.05. Three samples gave a light reaction with the Storch test.

According to the scores, samples which were considered too heavily salted, contain 2 per cent or over by the salt test, and samples which were considered almost too mild in salt, although not scored down, usually tested less than 1 per cent. It would, therefore, appear

that from 1 to 1 $\frac{1}{4}$ per cent salt in the butter is about right for the export trade.

It is gratifying to again note the uniform type of butter made in the different creameries. The texture, incorporation of moisture and salting so far this season is, in the opinion of the judges, more uniform than in the previous contests. There is still quite a wide differ-

ence in the colour of the different samples varying from almost white to a deep June shade. The defects in colour so far this season are very slight which shows good workmanship on the part of the buttermakers.

It will be difficult to beat the Edmonton sample, but there are still 27 creameries to hear from before the contest is finished.

RECORD OF PERFORMANCE FOR POULTRY

THE third series of the Dominion Egg Laying Contests is announced to begin on November 1, and continue for the full period of 52 weeks. In addition to the Canadian contest, which will be conducted at the Central Experimental Farm, Ottawa, provincial contests will be carried on simultaneously. The location of these contests is the same as last year, namely, at the Experimental Farms and Stations at the following points: Charlottetown, P.E.I., Nappan, N.S., Fredericton, N.B., Cap Rouge, Que., Ottawa, Ont., Brandon, Man., Indian Head, Sask., Lethbridge, Alta., and Agassiz, B.C.

The Canadian contest is open to all, while provincial competitions are open only to entries from within the province in which the contest is held. The rules and regulations for Dominion contest are the same as last year with the exception of one or two minor alterations. The contests are intended to

qualify birds for certificates in the Record of Performance, which is provided in two classes.

(1) All birds in the contests, not otherwise disqualified, whose eggs average 24 ounces to the dozen, and which in 52 consecutive weeks lay 150 eggs, will receive certificates of Record Performance AA.

(2) Certificates of Advanced Record of Performance AA will be provided for those that lay 225 eggs and fulfil the other requirements.

During the test the birds are under complete control of the officers of the Department of Agriculture at the respective stations.

Further details of rules and regulations may be obtained from the Director of the Experimental Farms System, Ottawa, and from Superintendents of experimental farms and stations where the contests are carried on.

RECENT AMENDMENTS TO THE REGULATIONS UNDER THE DESTRUCTIVE INSECT AND PEST ACT

BY L. S. MCLAINE, CHIEF, DIVISION OF FOREIGN PESTS SUPPRESSION

IN order to meet with new conditions which have arisen in connection with the outbreak of the European Corn Borer in the United States, it was necessary to rescind the Order in Council passed on May 24, 1920, and substitute the following which was passed on May 21, 1921:—

Section 7.—The importation of the following into Canada is prohibited:—

- (h) Corn and broom corn (including all parts of the stalk) cut flowers or entire plants of chrysanthemum, aster, cosmos, zinnia, hollyhock, and cut flowers or entire plants of gladiolus and dahlia except the bulbs thereof without stems, and oat and rye straw as such or when used for packing, throughout the entire year, also celery, green beans in the pod, beets with tops, spinach and rhubarb, from June first to December thirty-first, from the following counties in four of the United States of America:

Massachusetts.—Barnstable, Bristol, Essex, Middlesex, Norfolk, Plymouth and Suffolk counties;

New Hampshire. — Rockingham county;

New York (Central).—Albany, Fulton, Montgomery, Rensselaer, Saratoga, Schenectady and Schoharie counties;

New York (Western).—Cattaraugus, Chautauqua, Erie and Niagara counties;

Pennsylvania.—Erie county;

unless the same are accompanied by a certificate of inspection issued by the United States Department of Agriculture which states that the shipment is free from infestation by the European

Corn Borer. This prohibition does not apply to the articles enumerated when they shall have been manufactured or processed in such a manner as to eliminate risk of carriage of the European corn borer, nor to cleaned shelled corn nor to cleaned seed of broom corn."

It was also found necessary to change the domestic quarantine governing the movement of corn in the districts infested by the European Corn Borer in southern Ontario. Consequently the Ministerial Order known as Quarantine No. 2 (Domestic) was rescinded and the following Order-in-Council passed on May 18, 1921, was substituted therefor:—

Order in Council Quarantining Certain Areas on Account of the European Corn-Borer and Restricting the Movement of Corn and Corn Products in Said Areas.

Notice of Quarantine No. 2 (Domestic).

Effective on and after the 18th day of May, 1921. Supersedes Ministerial Order passed on November 29, 1920.

The fact has been determined by the Minister of Agriculture and notice is hereby given that an injurious insect, the European Corn Borer (*Pyrausta nubilalis* Hubner, new and not heretofore widely prevalent or distributed within and throughout the Dominion of Canada, exists in the province of Ontario, and that there is danger of this insect being spread into other districts by reason of the movement of corn plants or portions of plants infested with the pest.

Therefore the areas comprised in the following townships are hereby quarantined:—

Wainfleet, Humberstone and Bertie, in the county of Welland; Moulton and

Sherbrooke, in the county of Haldimand; Derham, Norwich north, Norwich south, Oxford west, Oxford north, and Nissouri east in the county of Oxford; that part of the township of Middleton north of the Grand Trunk railroad in the county of Norfolk; Bayham, Malahide, Yarmouth, Dorchester south, Southwold, Dunwick and Aldborough, in the county of Elgin; Dorchester north, Westminster, Delaware, Caradoc, Nissouri west, London, Bidulph, Loba, Adelaide, Metcalfe, Ekfrid and Mosa in the county of Middlesex; Zone, Orford, Howard and Harwich in the county of Kent; Usbourne and that part of the village of Exeter east of the Grand Trunk railroad, in the township of Stephen in the county of Huron.

All the aforementioned areas being in the province of Ontario, and by this Notice of Quarantine No. 2 (Domestic), do prohibit the removal of corn fodder or corn stalks, including broom corn, whether used for packing or other purposes, green sweet corn, roasting ears, corn on the cob or corn cobs, from the said quarantined areas to points outside those areas.

This quarantine shall not apply under the following conditions:—

- I. To the articles enumerated when they shall have been manufactured or processed in such a manner as to eliminate risk of carriage of the European Corn Borer.
- II. To cleaned shelled corn and cleaned seed of broom corn.
- III. To shipments of the articles enumerated transported through the quarantined areas on a through bill of lading.
- IV. To shipments of the articles enumerated for experimental or scientific purposes by the Dominion Department of Agriculture or the Ontario Department of Agriculture.

V. To shipments of dried seed corn on the cob for exhibition purposes and consigned to the secretary of a winter fair or exhibition duly recognized by the Dominion Department of Agriculture or the Ontario Department of Agriculture. Such shipments shall be inspected at point of destination by an inspector duly appointed under the Destructive Insect and Pest Act.

Any person who contravenes this quarantine will be prosecuted as provided for in the Destructive Insect and Pest Act.

This order shall take effect forthwith and be in force until further notice.

Quarantine Passed by the United States Department of Agriculture Prohibiting the Importation of certain Plant Products from the Province of Ontario.

On July 21, 1921, the Federal, Horticultural Board of the United States Department of Agriculture revised their Quarantine No. 41 (Foreign). By this revision an embargo was placed against the province of Ontario on account of the European Corn Borer.

The following plant products are prohibited entry into the United States from the province of Ontario unless the same are accompanied by a certificate of inspection stating that the shipment is free from infestation by the European Corn Borer:—

“Celery, green beans in the pod, beets with tops, spinach, rhubarb, oat or rye straw as such or when used as packing, cut flowers or entire plants of chrysanthemums, aster, cosmos, zinnia, hollyhock, and cut flowers or entire plants of gladiolus and dahlia, except the bulbs thereof, without stems.”

Under the previous ruling the importation of corn other than the clean shelled grain was prohibited.

An investigation is now being conducted to determine the amount of vegetables and flowers listed above, that are exported from the province of Ontario

into the United States under normal conditions. If it is necessary provision will be made for the inspection and certification of such shipments.

COMPENSATION FOR SLAUGHTERED ANIMALS

The Act to amend the Animal Contagious Diseases Act passed at the last session of the Dominion Parliament and referred to in the July-August number of *The Agricultural Gazette*, is not intended, as might be inferred, to terminate the granting of compensation for animals slaughtered on account of disease in May, 1924. The extension of three years provided in the Act has

reference to the augmented compensations paid for animals slaughtered, established by an amending Act passed in the spring of 1918. At that time compensations were increased from \$60 to \$80 per head for grade cattle; from \$15 to \$20 per head for each grade pig or sheep; from \$150 to \$250 for each pure-bred head of cattle and from \$50 to \$75 for each pure-bred pig or sheep.

REVISED CHARGES FOR TESTING SEEDS AND FEEDS

Due to the large increase in the number of samples received by the Dominion Seed and Feed Laboratories in recent years, together with the increased cost of operating the laboratories, it has been found necessary to revise the present testing charges. The Seed Commissioner, Mr. George H. Clark, announces that the following scale of charges came into effect from July 1, 1921:—

Purity test and grading.. . . .	50c.
Percentage purity test.. . . .	50c.

Germination test, ordinary seed supplies.. . . .	50c.
Germination test, florists' stock.. .	75c.
Microscopical examination of feeds..	\$1.00

The above charges will apply to all samples received. All samples forwarded for test should be accompanied by postal note covering the charges. This should be made payable to the Seed Commissioner.

As in the past, those who so desire may have the tests charged to their account, which will be payable annually.

PART II

Provincial Government Departments

VETERINARY BIOLOGICAL PRODUCTS

BY DR. C. D. MCGILVRAY, PRINCIPAL, ONTARIO VETERINARY COLLEGE

LITERATURE dealing with veterinary biological products is for the most part published in the form of scientific articles in professional journals, or as advertising matter in pamphlets issued by commercial concerns. In the case of the former they are as a rule not readily available for other than the professional person, and in the case of the latter they are in some respects misleading as the products are extolled commercially to such an extent as to create the impression that they are "cure alls" for every disease. As a result their proper use and benefit may not always be fairly estimated by others than the profession. In their general application biological products furnish a wide range of usefulness and, depending on their nature, may serve three distinct purposes, namely:—as diagnostic agents to detect certain infectious diseases, as immunizing agents to protect against certain infectious diseases, as therapeutic agents to assist in the cure of certain infectious diseases. The essential value of biological products in the detection, prevention and treatment of disease is based on the scientific phenomena associated with infection and immunity. By infection is meant the invasion of the body tissues with disease producing germs (micro-organisms) which multiply in the body and produce poisonous substances which may impair health or cause death. By immunity is meant the resistance which the body tissues offer to combat and overcome the invading disease germs,

prevent and lessen their ill effects, or counteract their poisonous products, thus protecting health and overcoming disease. This resistance to disease or immunity therefrom may be either natural or acquired. In the case of natural immunity it may be hereditary or inherent in a particular species of animal. For example, cattle are extremely susceptible to the disease known as Blackleg, while horses are immune to that disease. In the case of acquired immunity, it is the result of the animal having successfully withstood the infection or invasion of the body tissues by disease germs, or by the use of some special form of immunizing treatment. By means of biological products this immunizing treatment is possible and available for use to confer immunity on susceptible animals and thus protect them against certain harmful infections.

Having in view the fact that many of the real problems of animal husbandry are due to infectious diseases it is apparent that the use of veterinary biological products to live stock development must be encouraged towards promoting herd efficiency through the detection, prevention and treatment of infectious maladies. The list of biological products is becoming more extensive for each of these purposes and their value in promoting herd efficiency is becoming more fully realized. According to their nature they are grouped under distinct headings, namely, Vaccines and Sero-vaccines, Bacterins and

Sero-bacterins, Aggressins and Filtrates, Anti-bacterial Serums, Anti-toxins, Diagnostic Reagents.

Vaccines.—In the strict sense the term vaccine is applied to a biological product prepared in a laboratory by growing the living germs in suitable culture media and then attenuating or weakening them by special process if required. They are the oldest and best known group of biological products and furnish a reliable means of protection against certain infectious diseases destructive to live stock. Their beneficial effects consist in producing immunity through establishing a mild form of the infection and protecting the animal thus treated against subsequent natural infection. They should not be employed as curative agents as they are not suitable for treating the diseased animal. Among the diseases for which vaccines are most widely used to protect animals against are Anthrax, Blackleg, Hemorrhagic Septicemia and Contagious Abortion.

Sero-vaccines.—These are vaccines which are sensitized or modified by the bacteria being kept for 24 hours in the serum of an animal immunized against the same kind of bacteria. As the immune serum is rich in antibodies these adhere to the bacteria and sensitize the vaccine which may thus encourage a quicker immunity in the treated animal.

Bacterins.—These are also termed bacterial vaccines and consist of suspensions of killed bacteria in salt solution. They thus differ from true vaccines which are living cultures of bacteria, and generally produce a longer immunity than bacterins.

Sero-bacterins.—These are bacterins which are sensitized by means of immune serum. Bacterins are useful both as preventive and curative agents in certain diseases by stimulating the formation of antibodies or protective substances to combat the infection of the disease.

Aggressins and Filtrates.—These terms are applied to products which are germ free as a result of the bacteria being removed by filtering and the remaining filtrate or extract contains only the toxic substances produced by the bacteria. They are sometimes referred to as germ free vaccines but they are not true vaccines in that they do not contain the living germs as these have been removed by filtering, leaving the product germ free but still containing immunizing substances capable of affording a high degree of protection to animals against a fatal disease like Blackleg.

In the case of the products known as Blackleg Aggressin and Blackleg Filtrate, they differ in this respect, that the former is a filtrate of the tissue juices obtained from the affected parts of animals which have succumbed to Blackleg, while the latter is a filtrate obtained from cultures of the blackleg bacillus grown on special media in a laboratory. Both of these products have been found extremely reliable in protecting young cattle against blackleg and by their use losses from this disease can be prevented. Successful cattle raising has thus been made possible in many localities where blackleg has proved a serious hindrance.

Anti-bacterial Serums.—These are also termed immune serums, and consist of the serum of an animal which has been immunized with the organism of a specific disease. The usefulness of serums is based on the antibodies or protective substances which they possess. They produce an immunity of short duration and are also employed as curative agents. Hog Cholera Serum has been largely employed during recent years in the treatment of that disease and has encouraged the development of hog raising in many sections of the United States where hog cholera had prevailed extensively.

Anti-toxins.—These consist of the serum from the blood of an animal which has been immunized with the soluble

toxins of specific bacteria, as in the case of diphtheria and tetanus.

Diagnostic Reagents.—These consist of laboratory products which are used for the purpose of diagnosing or determining whether an animal is affected with a specific disease. Under this class is included Mallein used for the detection of glanders in horses and tuberculin to detect tuberculosis in cattle. These agents are the extracts from special culture media which is heated and filtered to destroy and remove the bacteria after growth is completed. They are therefore germ free products and cannot cause disease although possessing properties which induce a reaction when injected into animals with specific infection. They are harmless when injected into non-infected animals and produce little noticeable effect. When injected into animals having a specific infection they produce a marked effect or response which is termed a reaction. The nature of the reaction exhibited depends on the method of application and may consist of either a rise of temperature or a local swelling. As a result of the use of the Mallein test it has been possible to eradicate Glanders from horses in Canada. By the use of the tuberculin test the detection of tuberculosis is made possible and it furnishes the means by which this disease in cattle may be suppressed. There are three recognized methods of applying the tuberculin test which are known respectively as the Intradermal Tuberculin Test, the Ophthalmic Tuberculin Test, and the Subcutaneous Tuberculin Test. Each of these methods has a special advantage and they may be applied singly or in combination. The nature of the reaction exhibited depends on the method of application. In the case of the Intradermal method the tuberculin is injected into the layers of the skin on the un-

der side of the tail. The reaction effect produced in tuberculous animals is manifested by a characteristic firm swelling about the size of a walnut which persists for 72 hours. In the application of the Ophthalmic method the tuberculin is placed in one eye cavity. A preliminary or sensitizing dose is first given followed by a second or diagnostic dose. The reaction effects are manifested in a diffuse swelling, redness and a discharge from the treated eye, while the untreated eye remains unchanged as a control. The subcutaneous method is the method most commonly known and used. By this method the dose of tuberculin is injected beneath the skin. The reaction effects are manifested by a rise of temperature or fever reaction. Considerable skill and practice is required in the application and proper interpretation of any of these methods of the Tuberculin test, and should only be entrusted to the trained veterinarian. As a general rule high temperature reactions are to be considered as being more positive than low ones but the degree of temperature reaction or size of the local swelling should not be taken as a sure indication as to the extent of the disease because advanced cases may sometimes react less intensely than incipient ones. When an animal has given a distinct and positive reaction to tuberculin it should always thereafter be regarded as tuberculous.

Great credit is due to the Health of Animals Branch of the Department of Agriculture in Canada for the service it has rendered the live stock industry through the manufacture, distribution and use of biological products in the detection and prevention of disease. It is hoped that the efforts of the Branch may be further recognized by providing additional facilities with adequate staff which may be required to keep pace with the ever-increasing demands.

NEW YORK STATE EXTENSION SERVICE

Observations on a Trip to New York State to inquire into County Agent, Farm Bureau, and Boys' and Girls' Club Work

BY R. S. DUNCAN, B.S.A., DIRECTOR AGRICULTURAL REPRESENTATIVES FOR ONTARIO

DURING the latter part of June a party, composed of the Agricultural Representatives from the Counties of Prince Edward, York and Dufferin, the Assistant Live Stock Commissioner for Canada and myself, visited New York State to enquire into County Agent, Farm Bureau and Boys' and Girls' Club Work. We visited the Farm Bureau Office in ten counties, where we had audience with the County Agent, Home Demonstration Agent and Junior Extension Leader.

How the Extension Service Operates

The Extension Service, as operated in New York State, carries directly to the farms and homes the best available information regarding agriculture and home economics and secures its adoption in practice through the following agencies:—

- (1) *County Agricultural Agents*—who deal with farm problems;
- (2) *Home Demonstration Agents*—who deal with problems of the home;
- (3) *Junior Extension or Boys' and Girls' Club Work*—Comprising extension work with young people;
- (4) *Extension Specialists*—In various branches of Agriculture and Home Economics;
- (5) *Publications*.

At the time of our visit there were, in the State of New York, 55 County Agents; 14 Assistant County Agents; 27 Home Demonstration Agents with eight assistants; 3 County Home Demonstration Agents with three assistants; 16 County Leaders Junior Extension

Work with two assistants; 50 Extension Specialists or Subject Matter Specialists.

County Organization

The County Agent—called in Canada the Agricultural Representative—is the local Extension Representative, not only of the State College of Agriculture, but also of the United States Department of Agriculture and the people of the county.

A County Farm Bureau—which is an association of farmers and others in the county organized to develop and promote agriculture—has been formed to co-operate with the state and Federal Departments of Agriculture, in aiding the county agents in carrying on their work.

According to information received, one of the chief features of the County Farm Bureau plan is a representative membership, made up principally of the men of the farms, each paying a membership fee varying from \$2 to \$5.

The average number of farmers in the counties through which we passed was 4,800 and the average membership in the Farm Bureau, in these counties, was 1,063. This is less than one-fourth, or twenty-five per cent. We were also informed that approximately 60 per cent of the members renew each year. Of the \$2 fee, 50 cents goes to the state Farm Bureau Federation, 50 cents to the Federal Farm Bureau Federation and the balance to the county Farm Bureau.

The county Farm Bureau has an executive committee, consisting of a president, a vice-president, a secretary, a treasurer, and a committee of seven members elected at the annual meeting for a period of a year. The executive

committee meets monthly, secures necessary funds, authorizes expenditure of the Bureau's money, considers and approves programmes and projects and employs the county agents, who are approved by the state College of Agriculture.

In addition to the executive committee, local leaders or community committeemen, as they are called, are appointed. These men are usually the recognized leaders of the farm bureau's work in the community and develop the community programme.

Another of the outstanding features of the Farm Bureau system is that a definite programme of work for the year is laid out by the executive committee. This, of course, is based upon the results of a careful study of the agriculture and home problems of the county.

The county agent becomes the manager of the county Farm Bureau and is known as such amongst the farmers, rather than as county agent.

Each county Farm Bureau publishes monthly an 8-16 page paper called the "Farm Bureau News," which is practically self-supporting. It is distributed to the members only. The county agent acts as editor, and the time occupied in this capacity varies from three to six days per month.

Budget for County Agent Work

The United States Department of Agriculture and the New York State Department of Agriculture each contributes \$600 per year towards the salary of the county agent, the balance of the salary and expenses for the up-keep of the office, including services of stenographer, automobile rent, light, heat, furnishings, travelling expenses, advertising, etc., is secured locally, either from grants received from the County Board of Supervisors (in Ontario, County Councils) or from Farm Bureau membership fees. The average expenses of a county Farm Bureau vary

from \$5,000 to \$12,000, depending upon the programme of work.

Contrasting the two systems, Ontario and New York, it might be pointed out that in the former, where the average up-keep of an Agricultural Representative's office is \$5,500 or thereabouts, the provincial and federal governments each contributes approximately one-half and the county council only \$500. In New York State the federal and state departments of agriculture contribute but a small percentage of the total expenditures of a County Agent's office, the bulk of the money being secured from grants—\$2,000 to \$6,000—from the county board of supervisors.

Home Demonstration Agents

Wherever a Home Demonstration agent is located, a Home Bureau is organized, on a similar basis to that of the Farm Bureau, as a service for the farm women. The lines of work undertaken are such as the term "Home Economics" covers, including problems of health, food, clothing, housing, home furnishing and management in their relations to the welfare of the individual, the family and the community, and such other activities as the women themselves may determine.

The Home Bureau also has a membership, the fee being \$1 per year. The federal and state departments contribute in like manner to the salary of the Home Demonstrator, and the balance of the funds necessary to sustain the office is secured from the county board of supervisors. The Home Demonstration Agent is also called the Home Bureau Manager.

Junior Extension or Boys' and Girls' Club Work

A county board composed of the District Supervisor of Schools and equivalent representatives on the Farm and Home Bureaus directs the Junior Extension work in each county, and has general charge of all local clubs. The

board hires the Junior Extension Leader upon recommendation from the state Extension Department. The budget for carrying on the work is secured in the same manner as for the county agent and the home demonstration agent. Boys' and Girls' Club work, or Junior Extension work, as it is properly called, in New York State is developing rapidly. Ninety per cent of the enrolment is in the schools. The most important clubs are clothing, food, garden, potato, corn, poultry, calf, pig, and sheep clubs. Two of the most outstanding features of the club work in New York State are, first, that records are demanded in all projects and, second, that the boys and girls have the opportunity of taking part in team demonstration work in connection with each club or project.

Extension Specialists

There are approximately 50 Extension Specialists or Subject Matter Specialists, as they are generally called, on the extension staff of the State College of Agriculture, Cornell University, Ithica. These extension specialists are attached to the various departments, and are responsible to the professors or heads of such departments for their subject matter and to the Leader of the Extension Specialists for their programme in the field.

The travelling expenses of these specialists are paid in part by the Farm Bureau. They aid the county agents and home demonstration agents in their work, conduct extension schools in rural communities, hold conferences on special subjects, and lecture, part time, to the regular classes at the State College of Agriculture.

Observations

As the County Agent is hired by the farmers themselves and as the farmers contribute a cash membership fee, they naturally take a great deal more interest in his work than if he were hired by the State Department of Agriculture.

This plan, it is claimed, makes for maximum efficiency. It is recognized as one of the strong features of the New York State Farm Bureau system.

I am quite convinced that the plan of recognizing the community as the basis of work should appeal to practical thinking men. And, furthermore, I am more than ever impressed that the advisory agricultural council as tried out in a few counties in Ontario during the past winter is a step in the right direction. It is real co-operation we need in Ontario agriculture. One of the greatest objections to the Farm Bureau system is the difficulty of collecting the annual membership fee. As previously stated, approximately 25 per cent of the farmers in each county are members, and only 60 per cent renew membership each year.

While the Farm Bureau officers are supposed to be responsible for securing members, in many cases the county agent spends from two weeks to two months of his time on a membership campaign. This he cannot afford to do, as important extension work is neglected. In some counties a paid solicitor is engaged to secure membership fees. In one case the actual cost of collecting the fees exceeded the amount received in fees. Some other system of securing members may yet be devised which will relieve the county agent of this worry.

My observations would lead me to believe that county agents devote a considerable portion of their time to co-operative organization work and confine their activities to the older people—the farmers; whereas our agricultural representatives not only assist with co-operative organization work, but to a certain extent are subject matter specialists and devote a great deal of their time to boys and girls of school age and to junior farmers, as well as the older people. Our work in Ontario is essentially educational in character, whereas the county agents are devoting considerable time to assisting the farmers with their commercial problems—problems of buying

staple commodities and selling what the farmers produce. Demonstration and experimental work are carried on in much the same manner in New York

state as they are in Ontario, and those in authority state that the "show me" method is much more convincing than the "tell me" method.

THE WORK OF THE NEW YORK STATE COUNTY AGENT

BY W. R. REEK, B.S.A., ASSISTANT DOMINION LIVE STOCK COMMISSIONER

THE value of good roads is strongly impressed upon a Canadian visitor to New York State; the cost is overshadowed by the economic value for ease of transportation of products. Undoubtedly, their great development in the Empire State is largely due to the immense wealth concentrated in the cities which gather toll from the entire union.

Large markets near the point of production have encouraged specialized agriculture where the soil and climatic conditions were suitable and in other parts dairying has developed. Very few sheep are seen and a much smaller number of heavy horses per farm than may be noted in Ontario.

The County Agent appears to play a considerably different role than in Ontario. In comparison the Ontario representative system stands out as a strong educational system, whereas the New York organization is partly educational and partly commercial, with emphasis on the latter. They are engaged and paid principally by the counties; in no case does a county receive more than \$600 from the state and \$600 from the federal government. Their expenditures range from \$8,000 to \$12,000; consequently the farmers pay directly through Farm Bureau membership fees or through the county councils for the services of an expert. Under such a system it is quite natural to expect that the agent would have to attend to commercial activities. The work with the boys and girls is cared for by the assistants.

A staff of specialists supplied by Cornell University is always available to assist in any definite branch of agriculture. This is very commendable, because the activities of the College are carried immediately to the farmers. There is, however, no compulsion in regard to the agent making use of this assistance. Perhaps their staff in mechanics and gasoline engines are most in demand and their work so thorough and practical that the method might well be adopted.

The appointment of a Home Demonstrator in many counties is an excellent idea. The women should receive equal assistance with the men. Organization for dressmaking, cooking, canning, civics, recreation and other activities is carried on. The use of local women as leaders develops a great deal of local talent which might otherwise have remained dormant. Not every woman graduate is suitable to be a home demonstrator.

The report system adopted is a large factor in binding the agent to the extension department at the College, but the great amount of detail required must consume a large amount of time on the part of the agents.

The most interesting developments agriculturally are the building up of the large co-operative organizations and the methods employed in carrying out the plans. The sale of milk to the large cities by the people through their central organization, the caring for any surplus from day to day, and the binding contracts which men are signing by

thousands would convince even the most prejudiced that co-operation if properly conducted is an excellent method for the marketing of agricultural produce. The argument that near-by markets are prejudicial to co-operation is shattered. Many ex-county agents are to be found organizing and managing such enterprises, and no doubt the training received in the counties fits them for graduation in the larger fields.

That the agents as employed by the farmers are very well paid is a noteworthy fact and undeniable proof that the farmers believe the men who organize and care for their business should be well paid; consequently, many very able young men are attracted to the work.

Perhaps the outstanding facts to be noted are as follows:—

- (1) The great part played by the farmers in New York in management and financing;
- (2) The very slender connection with the Governments;
- (3) The opportunity for individualism in County Agents;
- (4) The staff of experts supplied by the College;
- (5) The Home Demonstrator;
- (6) The lack of central control of policy in New York State;
- (7) The greater return financially for individual effort;
- (8) The strength of the Ontario system as an educational factor.

THE EMPLOYMENT OF MOTION PICTURE FILMS FOR AGRICULTURAL INSTRUCTION

MANITOBA

MOTION Pictures have been adopted as an integral part of the agricultural extension work for the province of Manitoba. The pictures are used for two distinct purposes,—promotion and education. Under promotion might be included pictures intended to emphasize the importance of the various phases of the extension work such as demonstration team work, Boys' and Girls' clubs, ploughing matches, etc.

Two years ago the Pathescope Company of Toronto made seven 500-foot films in Manitoba under the direction of the Manitoba Department of Agriculture. These were "Judging the Dairy Cow," "Out With the Chickens," "The Gang Plow," "Injurious Insects," "Breed Types at the Brandon Fair," and "The Agricultural Society Fair." During the past summer two 1,000-foot films were made, one on "The Ploughing Match" and the other "Demonstration Teams." Four copies of these films were made and were kept constantly in circulation throughout the winter in

connection with the short courses and institute meetings. Judging from replies received in answer to an enquiry sent out immediately after the various meetings, the attendance was increased fully 50 per cent by reason of the pictures.

In addition to the Manitoba films, about twenty Ontario subjects and 12½ of the regular standard pathescope films have been used and have given satisfaction. We are fortunate in being able to co-operate with the Dominion Live Stock representative in Manitoba and have been able to show a number of live stock films belonging to the Dominion Department of Agriculture to a considerable number of Manitoba audiences.

The Department owns nine Victor cinemas and three pathescope machines. Each lecturer takes with him a motion picture machine and six or seven films. He also takes with him a storage battery suitable for six-volt lamps, as we have found that the kind of storage bat-

tery which we can borrow is either too strong or too weak. When too strong, the lights are destroyed, and when too weak the pictures are not good. For the most part the pathoscope machines have been used in the territory between the lakes, the difficulty of getting batteries charged being too great, as in some cases lecturers have been back as far as 45 miles from the railway, and it is at these points that pictures are appreciated most.

There are a number of community organizations in the province that own

Victor cinema machines, and occasionally films are sent out to these organizations. However, these organizations secure their films for the most part from Strains, Ltd., Winnipeg, as the department finds it difficult to spare films during the winter months, which is the period during which community organizations are most in need of films. A general regulation has been adopted that, where we send out films, at least two of the six shall be on agricultural subjects and two others on subjects of a distinctly educational nature.

SASKATCHEWAN

THE Department of Agriculture of the province of Saskatchewan announced recently that a Motion Picture Bureau was in process of organization. The Deputy Minister, Mr. F. H. Auld, makes the following statement in this connection: "The bureau will be a clearing house for the preparation and distribution of agricultural films of an educational nature. It is our

intention to co-ordinate as closely as possible not only the moving picture activities of the various departments and the university, but to plan with the other western provinces educational pictures which all three prairie provinces will be able to use and thereby reduce the expense below what it would be if each province were required to make original films of all necessary agricultural subjects.

QUEBEC

For the last thirty years, educationalists have been steadily endeavouring to improve the methods of teaching, to make them less dogmatic in character, more concrete, more lifelike and therefor truer and more logical. One of the happiest consequences of these endeavours is the teaching of agriculture by "sight," which is being done at the present time by a liberal use of illustrations, by tables, diagrams, and slides or moving pictures.

The latter method—the teaching of agriculture through moving pictures—has been introduced, and it looks as

though it would soon supersede all others. The educational value of the cinema has not escaped the attention of the Honourable Mr. Caron, Minister of Agriculture for the province of Quebec. An improved apparatus has been purchased lately, together with several films dealing with the improvement of field crops and illustrating the principal breeds of cattle. These have been successfully tried in a first series of lectures, and M. A. Desilets, director of agricultural teaching and organizer of lectures in the province, states that he is delighted with the results. Other films are being prepared.

A MOTION PICTURE BUREAU FOR NOVA SCOTIA

BY DR. M. CUMMING, SECRETARY FOR AGRICULTURE

THE Nova Scotia Department of Agriculture has established the nucleus of a motion picture bureau. The films used are in part local films, the scenarios for which were prepared by members of the departmental staff, and in part copies of films purchased in the main from the Ontario Department of Agriculture, which department has been very helpful in complying with requests for the purchase of duplicates of films prepared under the direction of its officials.

The arrangement under which local films were made was a joint one made between the Department of Agriculture and the Dominion Atlantic railway, which is a branch of the Canadian Pacific railway, whereby the Pathescope Company of Canada provided photographers whenever their services were required. The provincial Department of Agriculture, in addition to using the films that were taken particularly for its own use, also obtained the use from time to time of films taken under the direction of the Dominion Atlantic railway and vice versa.

The principal subjects illustrated in these films were as follows: "Growing of Silage Crops," "The Marketing of Wool," "Cream Grading; Why?" "Cow Testing," "Potato Growing," "Orchard Spraying," "Poultry Raising," "Local Scenes."

All the films at present owned were prepared by the Pathescope Company of Canada. The Department owns several of that company's motion picture ma-

chines, as does also the Dominion Atlantic railway. Both the foregoing managements have exhibited these films extensively at meetings held in various parts of the province. So far as the provincial department is concerned, the films have been used by different officials of the department as well as by field men of the Federal Department of Agriculture, with which department the provincial department co-operates in every possible way.

Local films are preferred, but films secured from other sources have added to the interest, not only because of their educational value in relation to any particular subject, but also because they have conveyed, in a most practical fashion, knowledge of agricultural methods adopted in other parts of the world.

All the agricultural officials who have used films are unanimous in commending their value. This is two-fold: first, they convey to the eye information which language alone could never convey; second, advertising the fact that films will be used at a meeting seems always to insure a larger audience than would otherwise be secured. The writer knows of only one objection to the use of films and that is the expense involved, a matter which must receive careful consideration in these days when economy of administration is very properly insisted upon by governments. It is our intention to continue and to extend this film service on a basis consistent with the finances of the department.

A LENDING LIBRARY OF LANTERN SLIDES

BY A. E. OTTEWELL, DIRECTOR, DEPARTMENT OF EXTENSION, UNIVERSITY OF ALBERTA

IN our Department of Extension we conduct a lending library of lantern slides containing approximately 250 sets. We have also a rental library of moving picture films of the Safety Standard type. We are now managing our own photographic and slide-making department. The photographer takes photographs of experiments which may be under way by the College of Agriculture or any other departments of the University and makes up the material into slides for use both within the University by instructors and also for use by borrowers throughout the province. The lantern slide service is free except for the payment of express. During the academic year closing June 30, approximately 125,000 people attended lectures given with the aid of lantern slides lent from our library; and about 25,000 people saw exhibitions of our moving pictures. In view of the numbers reached, I am of the opinion that

a lantern slide lending library is the cheapest form of extension service. The great difficulty is to secure good material to accompany the slides.

The lantern slides cover a wide variety of subjects which are divided into series under the following headings: Travel and Geographical, Industries, Agriculture, Natural History, Biography, Historical, Popular Science, Literary, Art, Biblical, Missions, Home and Foreign, Patriotic, Fairy Tales and Children's Stories, Social Work and Welfare, European War, and University of Alberta.

Special attention should be called to the preparation of a complete set of slides on Art for use in the schools, and to a series now in preparation covering Canadian History. This will be available for the coming school year.

The motion picture films are varied in character and are intended to be both instructive and entertaining.

MOTION PICTURES, LANTERN SLIDES AND GATE SIGNS IN CAMPAIGN FOR BETTER SIRES

BY J. E. RETTIE, ASSISTANT LIVE STOCK DIRECTOR, ONTARIO DEPARTMENT OF AGRICULTURE

THE ultimate object of the campaign for better sires is to improve the quality of the beef and dairy herds of the country. To achieve the object it is necessary, first, to create in the minds of farmers an interest in and a desire for a better class of cattle. This cannot be done by writing and talking alone. The ideal way to create this interest would be to have the people see numbers of good cattle. As this is seldom practicable, the next best thing is the use of good pictures. It is in this direction that we have found motion pictures useful. If you can show an audience a number of reels of high class cattle, you secure their interest immediately, and when shown in pastures similar to the pastures in their

own fields, the appeal is very strong. Wherever such pictures have been shown, it has resulted in a number of the audience making enquiry about breeding, feeding and methods of caring for cattle to obtain the best results.

Motion pictures are not well adapted for making studies of type. It is in this connection that we have found lantern slides valuable. The slides we have used have included close-up pictures of ideal representatives of all breeds contrasted with slides of undesirable and unprofitable types. One of the most interesting is a series showing a number of scrub cows, the good bulls to which they were bred and the resulting calves. This is the next best thing to having the animals actually

there. In brief, motion pictures secure the attention of the audience and create a desire for more information; lantern slides illustrate types and methods. Motion pictures made on Ontario farms have been used to illustrate the leading beef and dairy breeds. Wherever possible, groups of animals by one sire are included to show uniformity and high standard of breed type.

It is proposed to prepare a picture of market animals showing different grades. Some examples of grade cows of poor to fair quality with their calves by high class bulls, showing marked improvement in one generation by the use of a good sire, have been secured. It is hoped to secure more of these as they are the very best of object lessons.

The Use of Gate Signs

In an educational campaign there are a number of essentials one of which is to create an interest in the minds of those you wish to influence. It is not an easy matter to reach the man who most requires instruction. Bulletins and other literature sent to him often find their way into the waste

basket unread. He is not easy to get out to meetings where the matter is to be discussed. The main object in using these signs is to reach the man who does not read bulletins or attend meetings. When he sees a sign on his neighbour's gate announcing the fact that a pure-bred bull is kept on that farm, it starts him thinking. If every farm where a pure-bred bull is kept is indicated in this way, natural curiosity will as a rule lead a man to make inquiries. Such an individual will probably have been claiming that his grade bull is just as good as the pure-bred, but he soon realizes that if he keeps a bull and has no sign up stating that it is pure-bred, the inference is that it is inferior.

The spirit of "Keeping up with the Joneses," while it may in some cases cause discomfort, is a real factor in human progress. When you get a man in a receptive frame of mind, you have accomplished considerable; in other words, you have fertile soil. The mission of the gate sign is to create interest, and in this it is succeeding in a great measure.

EXTENSION ACTIVITIES OF MACDONALD COLLEGE

AGRICULTURAL extension work carried on by Macdonald College is looked after by the individual branches of the college rather than by a separate division as is the case in some of the provinces. The work is designed to promote the prosperity of the province through live stock, field crops, horticulture, poultry, women's work and the rural school.

Animal Husbandry.—The promotion of the sheep industry in Quebec province has been the major feature of extension work in animal husbandry. Assistance has been given in the developing of sheep and wool clubs and through them the sale of wool and the

distribution of pure-bred sheep. Recently these activities have been directed by the Dominion Wool Growers' Association and the Dominion Live Stock Branch. Some of this work has been continued in a co-operative way, through assistance at sheep demonstrations and sheep breeders' meetings, but owing to lack of funds it has not been possible to launch any new work.

Cheviot sheep have been introduced and distributed through different sections of the province with the result that the breed has gained quite a foothold in Quebec and largely from this province the Cheviot has found its way into practically every province in the Dominion.

Other extension work is confined to what might be called the "field work" of the various members of the department. This work is not centred in any single feature but serves as a means of contact between the department and the various farming interests with which it has to deal.

Cereal Husbandry.—The extension work of the cereal husbandry department is directed along lines of popularizing information obtained relative to crops and varieties and in co-operating in the general campaign for the improvement of the seed supply in the province of Quebec.

The value of fall rye is being emphasized. On the experimental grounds this crop has demonstrated its adaptability both as to winter resistance and productivity. This information has been supplemented by the experience of a number of farmers in various parts of the province. By means of acre blocks of fall rye the possibility of growing this crop and the fact that it is a really high yielder are being demonstrated in a number of sections.

The question of a satisfactory variety of corn for silage purposes is of importance and more particularly so in those districts where the season tends to be short. The department having through its tests determined that the best combination of yield and early maturity is at present found in North Western Dent Corn, this variety is being made known to farmers in a number of districts. This is being accomplished by means of general publicity and by field demonstrations which this year approximate fifty.

The study of oat varieties has demonstrated that the Alaska Oat combines quality, i.e., low per cent of hull, and yield, to such an extent that it is a very excellent oat for some sections, the additional characteristic of very early maturity usually adding materially to

its value. This variety was introduced in the province through the cereal husbandry department and is being followed up with the object of not only making the variety better known, but also that of establishing a good seed supply.

The department is assisting in the general campaign being conducted to improve the seed supply in the province. The greatest effort is in the co-operative arrangement with the Quebec Department of Agriculture and the Quebec Co-operative Society of Seed Producers whereby pure seed is being produced for distribution of seed centres. The work of production is being conducted by the cereal husbandry department on the land owned by the Co-operative Society at Ste. Rosalie Junction, P.Q., and financed by the Quebec Department of Agriculture. As soon as this project is fully organized elite stock seed is to be produced and will be distributed to seed centres, the product of which will assure the Co-operative Society and the farmers of the province a good supply of registered seed. This project is specially noteworthy, as it connects the organizations, working toward the improvement of the seed supply. Through it the department of agriculture, the college, and the farmer are making a united effort. With such co-ordination the improvements obtained will be much more rapid and stable.

Naturally, general extension work is being conducted by the department of cereal husbandry. However, the effort is not in general lines but is made more specific as solutions are found for the problems that present themselves and as superior material, in the form of new varieties or strains, becomes available.

Horticulture.—The extension activities carried on by the horticultural department during recent years have been limited owing to the nature of the work at the college which requires the major part of the time of the staff.

There is great need for extension work in this province among the fruit and vegetable growers, especially to carry to them better methods in the culture of their crops, in the better choice of varieties, in the use of manure and commercial fertilizers, in the control of insect pests and fungous diseases, etc., and in order that this work be effectually undertaken it would require extensive field demonstrations and experiments and require the services of one or more men constantly on the work rather than as at present intermittently as opportunity affords.

The following are some of the activities in extension work which are being given attention by the department:

Spraying experiments and demonstrations in connection with the control of diseases and insects, of the apple and potato, and in the control of onion smut.

Field experiments in the control of the onion and cabbage maggots.

Encouragement is given in the cultivation of small fruits.—Plants of good varieties of strawberries and raspberries have been sent out, for trial, to various places in the province. Strawberries, raspberries and plants of red and black currants have been sent to the Boys' Farm at Shawbridge, where these fruits are to be grown on a large scale in connection with the farm work in educating the boys along agricultural lines. Similar distribution of plants has been made to many returned soldiers who have taken up land in the province.

Improvement of the grounds of rural and town schools and academies and also a few churches. Plants of trees, shrubs, vines and perennial flowers have been sent to about 30 schools and four churches. Of these, at a number of schools the plants have been well cared for and a considerable improvement has been made in the appearance of the grounds. At some places little care has been given the plants and they

have been trampled on, grazed by animals or allowed to grow up in grass. This work could be made a strong educational feature at many schools but would require to be followed up carefully by frequent visits to give supervision to the plantings and instruction to the teacher and pupils.

Distributions of plants, bulbs and seeds of flowers and vegetables have been made to school children in the rural sections of the province. Liberal packages of seeds or plants have been sent to as many as 5,000 children in one year. This work has been entirely taken over by the Quebec Department of Agriculture during the past year.

Lectures and demonstrations have been held at various centres in the province and judges have been provided for many exhibitions. Advice on a variety of subjects is given by correspondence and through visits to the more important sections of the province.

Poultry.—For a number of years the poultry department of Macdonald College has been doing considerable extension work, as shown by the following list of the chief lines of work.

1. Considerable literature has been circulated, including bulletins, leaflets, circulars, and blueprints of buildings, appliances, and trap-nests.

2. The following numbers of sittings of hatching eggs have been distributed to school children, free of charge: in 1913, 100; in 1914, 425; in 1915, 610; in 1916, 541; in 1917, 658; in 1918, 892; in 1919, 740; and in 1920, 750.

3. School Fairs: The following numbers of school fairs have been held: 1913, 3; 1914, 9; 1915, 14; 1916, 13; 1917, 21; 1918, 24; 1919, 25; 1920, 32.

4. Community Breeding Centres. Several demonstration flocks serve as a source of supply for eggs for school fairs and as community breeding centres in the distribution to the surrounding community of eggs from im-

proved flocks. In these flocks there are used as male breeders only pedigreed bred-to-lay cockerels from Macdonald College. The flocks are inspected twice a year and are culled in the fall.

5. *Demonstration Poultry Houses.* Six demonstration poultry houses were erected in 1913 at various places in the English-speaking sections of the province. Using these houses as models, a large number of houses have been built by farmers.

6. *Demonstrations and Lectures.* A large number of demonstrations and lectures have been given at meetings of poultry associations and farmers' clubs, the chief emphasis being laid upon the fattening and dressing of poultry for market and the selection of breeders and layers.

Quebec Women's Institutes.—The work of the women's institutes in the Province of Quebec is carried on by a staff of extension workers sent out by the School of Household Science, Macdonald College. These women's institutes, fifty-five in number, are almost entirely in the rural districts. They are assisted by these extension workers in organizing, and taught how to conduct their meetings and work. Demonstrations in household problems are given; also lectures on topics of interest—thus helping to realize their motto "For Home and Country."

A circulating and clipping library has been started at the college, from which any member, upon application, may receive information for her papers or talks. This the women find most helpful, and constant inquiries come for material on different subjects.

The women's institutes with a membership of over fourteen thousand, and this number is increasing steadily, have progressed in their work to such an extent that they now have their own provincial organization, which furthers and strengthens their work.

Such problems as child welfare, better schools, agriculture, community im-

provement, etc., as well as matters pertaining to the immediate home are taken up and studied by the institutes at their monthly meetings, and where possible, put into practice.

Women are realizing and appreciating the advantages obtained from this organization, and the work is rapidly growing.

Rural Schools.—All of the energies of the rural school department are devoted to extension work with the pupils in the Protestant schools of Quebec province, although certain relations with adults are necessary in order to bring about new movements. The department was formed in 1915 and the first year was spent in instructional and survey work of an agricultural nature. In 1916, the management of the school fairs for English-speaking children was given to the department, and from that time until the fall of 1920 the entire time of its members was spent in endeavouring to make a success of that work.

School fairs vary greatly and may be organized and held with very little or very great work attached. Directly proportionate with the work is the amount of good derived from them by the children. The rural school department endeavoured to carry personal instruction and a personal interest to every child. This took a large amount of time and made it impossible to reach as many children as could have been reached had other policies been followed, but the returns decided those in charge to work intensively.

In the fall of 1920 the Provincial Government took over the operation of all school fairs in the province. During 1921 this department, which, because of lack of funds, is limited to one person, has been engaged in an exhaustive survey of social conditions, and in an effort to improve the nature of the agricultural instruction in our public schools. It is hoped that in the fall of 1921 a new line of work will be under way which will have a strong influence on the lives

of the teen age and younger boys and girls.

Short Courses of Instruction.—Macdonald College, in addition to the regular courses, provides short courses of study during the winter months in agricultural engineering, animal husbandry, cereal husbandry, horticulture, poultry and the farm home, and carries on similar courses at different centres in the province. It also provides a summer school for rural improvement for country clergymen and others interested in rural welfare. The purpose of this latter course, which is usually held during the

first two weeks of August, is to give instruction and inspiration to the rural minister and all others interested in country life who devote all or any part of their time and energy to the advancement of the rural community. Instruction is given by members of the staff of the institution, and recognized theological and social science authorities upon the essential problems of rural communities—sociological, recreational, and economical—as well as elementary instruction in those branches of agriculture which are most needed by the country minister.

EXTENSION WORK OF THE NOVA SCOTIA AGRICULTURAL COLLEGE

BY DR. M. CUMMING, PRINCIPAL

THE educational work of the Nova Scotia Agricultural College may be divided into three divisions: Instruction, Demonstration and Investigation. Each of these divisions is more or less involved with the other so much so that in treating with any one division one is bound to consider to a certain extent any other division of the work.

The main course at the Agricultural College, Truro, is a two-year course consisting of two terms each of six months duration. In addition, certain of the staff teach in the Rural Science School for Teachers which is conducted during a five-week period in midsummer. Even including the summer work, the regular college programme leaves considerable time both in winter and summer in which the various members of the staff may devote their attention to extension work. It consequently happens that the extension service of the Nova Scotia Department of Agriculture is largely under the direction of the members of the staff of the Nova Scotia Agricultural

College who carry on part of the work themselves and who direct the balance of the work either through county agents or special employees.

Instruction

The special Farmers' Two Weeks Short Course held at the college annually in the month of January and corresponding Short Courses held in March for Dairymen and Short Courses in Household Economy held at various seasons of the year, may be regarded as largely in the nature of extension courses, for in the main, they are attended by a class of students who either have not the time or the qualifications for taking a regular course.

The college staff, usually assisted by members of the Dominion Department of Agriculture, annually conduct from five to ten short courses of from three to five days' duration each at various centres in the province. In order to make these short courses as efficient as possible, the department has co-operated with eight communities to erect agricul-

tural buildings especially suited for the conducting of large short courses. The courses conducted in these buildings have been largely attended and have been signally successful, whereas courses attempted in improvised buildings, that were not suitable for the purpose, have not proven as successful.

In addition to short courses, educational meetings are held in the various counties of the province, but, in the main, these are conducted only when some special propaganda such as Dairying, etc., is being put forward.

Demonstration

Demonstration work has been carried on in special communities of the province where it was regarded that such work would prove effective. For example, for a number of years demonstrations in the best methods of growing turnips were conducted in a large part of eastern Nova Scotia where the growing of this crop had been neglected. Similar demonstrations were conducted in potato growing, potato spraying, the use of fertilizers and ground limestone, sheep dipping, etc. It has been found much more effective to carry on this demonstration work on the farms of selected farmers under average conditions than to do it on a so-called "government" or "model farm." Sometimes this demonstration work has been done by members of the college staff, but more frequently by county agricultural representatives directed by the heads of departments on the college staff.

Investigations

Partly with a view to determining results under ordinary farm conditions and partly with a view to making certain lines of investigation to partake of

the nature of demonstration, a considerable amount of the investigation work in insects, plant diseases, fertilizers, including lime, has been conducted on farms throughout the province. Usually this work has been checked up by similar work on the college farm so as to insure its scientific exactness.

General Measures

Any extension service must be adapted to the community in which it is conducted. Hence it has transpired that, although most of the extension service of the Nova Scotia Department of Agriculture may be included under the foregoing, still, in certain parts of the province, it has been deemed wise to go further and assist farmers more definitely in certain marketing and other problems. Along this line the Nova Scotia Department of Agriculture now operates three large creameries and a cereal mill in eastern Nova Scotia. Lime crushers have also been operated, although this work has now been concluded. These tangible efforts have afforded the Department an additional opportunity of conducting instruction and demonstration work in the communities that were being served, but, of course, they were quite uncalled for in other communities where such services were better conducted through private enterprise.

Extension work is gradually being introduced through the Rural Science Division of the Department of Education into the common schools of the country, and it is hoped that this branch of extension work may be further and further developed, as it is fundamental in character and will ultimately lead to the dissemination of agricultural education into almost every home in the country.

CONFERENCE OF ONTARIO AGRICULTURAL REPRESENTATIVES

THE fourteenth annual conference of the Agricultural Representatives of the Ontario Department of Agriculture at the Agricultural College in July is reported to have been the most satisfactory of any hitherto held. Practically two and a-half days out of the four were taken up with committee meetings and reports of committees so as to give full scope to the bringing forward of suggestions and recommendations bearing upon the work engaging the attention of these local representatives of the department. A synopsis is presented of these reports insofar as they relate to matters of more or less general interest.

Live Stock Improvement

The committee on Live Stock Improvement reported that in their belief the time had arrived for legislation to assist in the campaign for Better Sires, and recommended that legislation be prepared covering the following:

1. To make it compulsory for township councils to take by their assessors an annual census of bulls and, if practicable, pure-bred stock.

2. To make it an offence to permit bulls to be in fields or areas not bounded by a definite sort of fence.

3. To make it illegal to collect service fees for grade bulls.

The Committee also made the following recommendations:

1. That a bonus, 20 per cent of the cost price, be made payable on application to those who buy a pure-bred bull for the first time. Such animals should be subject to the approval of the Live Stock Branch; a maximum price of say \$250 would probably be advisable.

2. That all the cattle being offered in sales which expect to receive the government grant be inspected.

3. That freight on car or half car lots being shipped to market be continued.

4. We suggest an exhibit of three, a good pure-bred bull, an ordinary grade cow and the offspring of these two, to be compared with three of the other class, namely a similar kind of cow, a scrub bull and a calf resulting from the mating of these two, such exhibit to be sent to a number of county fairs.

5. For the smaller fairs, we would recommend the preparation of a real exhibit to include projected pictures and first-class charts, etc. An exhibit of this kind should outclass any similar feature in the fair in order to be worth while.

6. Feeling that there is an immediate and permanent need of a bulletin or other publication on the "Principle of Breeding," we urgently recommend that the Live Stock Branch undertake the preparation of a publication dealing with the subject as simply as possible, the same to be well illustrated by many pictures, diagrams, charts, etc. These latter could be utilized as slides and lecture charts.

7. As we have found that where gate signs have been sent out in considerable numbers, they are appreciated and being asked for, we would recommend that the department continue supplying same.

With respect to the campaign for better sires, the committee considered that the work should be undertaken in smaller territorial units with a local committee in charge of each, and that the procedure should include well advertised meetings addressed by live stock experts and illustrated by motion pictures followed by press notices. Also that efficient follow-up work be instituted whereby every farmer keeping a "scrub" bull should be personally interviewed.

Improvement of Swine

The committee on Swine Improvement reported that, in their opinion, it would be in the best interests of the swine industry of Ontario if market hogs were paid for on a graded basis, the standard grade to be the bacon hog, and that a committee composed of representatives of the producers, the packers and the Department of Agriculture be formed to devise a basis for the establishment of grades and the operation of grading. Also, that as soon as possible the government provide for grading demonstrations at shipping points in accordance with the demands of the industry.

Judging Competition

The Judging Committee expressed its approval of the proposed courses and competitions to be conducted jointly by the provincial Department of Agriculture and the Educational Committee of the Canadian Swine Breeders' Association. It was recommended that, for this purpose the province be divided into six districts, and that during the month of December, three-day courses be held at selected points in each district. The programme recommended was as follows:—

First Day

A lecture and demonstration on Curved Sides;

A lecture and demonstration on Carcasses;

Lecture and demonstration on Judging Live Hogs.

Second Day

Inspection trip through packing plants;

Inter-County Judging Competition—teams composed of nine Junior Farmers;

Judging Live Hogs:—

(a) Judging 6 pigs of bacon type (written and oral reasons);

(b) Judging 4 pair bacon hogs (written and oral reasons);

(c) Judging 4 groups of 6 hogs each (placing only);

Lecture and Demonstration, Diseases and Meat Inspection, Representative of Health of Animals Branch, Ottawa.

Demonstration and Judging and Grading of Carcasses.

Third Day

Judging of carcasses of hogs judged on day previous:—

(a) Judging and grading carcasses, 6 pigs bacon type (written and oral reasons);

(b) Judging and grading carcasses, pairs bacon hogs (written and oral reasons);

(c) Judging and grading of carcasses of groups of hogs (placing only).

Poultry Breeding Stations

The committee on Poultry Stations endorsed the plan of distributing improved poultry throughout the province by means of these stations, and recommended that each Representative establish a sufficient number of stations in his district to supply all eggs for school fair purposes. Wherever possible, these should be within a 20-mile postal radius of schools taking eggs.

The committee reported that after observing the results of charging the pupils full value for eggs, they recommended that this system be continued. This was not to apply to the newer districts. Also that where pupils failed through no fault of their own, a system of compensation should be instituted. It was further recommended that it be arranged for station operators to send in complete and accurate records. Properly kept records would furnish valuable information on costs, breeding, etc.

Junior Farmers' Improvement Associations

The committee on the above revised the constitution of these associations and made a number of minor changes

FARM BUSINESS SURVEY IN ONTARIO

BY H. C. MASON, B.S.A., FARM ECONOMICS DIVISION, ONTARIO AGRICULTURAL COLLEGE

THE first farm business survey in the province of Ontario was made in Caledon township, Peel county, in the fall of 1917. This small survey, covering 113 farms, was the first systematic effort made in Ontario to secure authoritative information and figures upon the farming industry as a business proposition.

In the spring of 1918 a much larger survey was made, covering 437 farms in Oxford and 340 farms in Dundas. The sections surveyed were the foremost dairy districts of western and eastern Ontario respectively. These surveys were continued in the spring of 1919; after that time the Dundas work was dropped, but the Oxford survey was continued until the spring of the present year. The work was extended still further in the spring of 1919 to cover the beef-producing industry of North Middlesex and mixed farming in parts of Wellington, Dufferin and Peel counties. The year 1920 saw a continuation of the above surveys, together with a special investigation in York county into the cost of producing milk for the Toronto market. An initial survey of the apple-growing and mixed farming area of Durham county was undertaken in the same spring. Work was also commenced upon the cost of producing tomatoes for market in the Niagara district, and later a complete survey of 178 fruit farms was undertaken in the same section.

This year's work has been even more extensive than that of previous years. The Oxford, Middlesex and Durham surveys have been continued, and a new investigation has been started into the particular type of mixed farming followed in Kent county in the southwestern part of the province. Much work has also been done upon the cost of beef production in western Ontario, in relation to freight rates, and the find-

ings of this investigation were recently presented before the Railway Commission. Reports upon the results of these surveys are already in print or will be issued shortly.

An important branch of the work of the department is the introduction of a system of cost accounts. Representative farmers in Oxford, Dufferin and Durham, numbering in all about 75, are keeping full accounts of everything connected with the farm business under the personal direction of the department's specialist in cost accounting. This work is expected to bring out some extremely interesting and valuable facts and figures, and at the same time to be of great benefit to the farmers engaged in it.

Another undertaking which is about to be embarked upon is the investigation of markets, marketing conditions, and co-operative enterprises. Under present conditions there is a very great demand for work along these lines, and this branch is expected to develop as rapidly as has the farm survey proper.

The value of the work of this department cannot yet be estimated. Already it has secured and made available information of great value to the farmer in the organization of his business, whether he is interested in dairying, beef-raising, fruit-growing, or any one of the several types of mixed farming. It is taking up the work of training the future agricultural leaders of Ontario as analysts of farm business. With the development of the work in cost accounting and marketing its value to the farmer will be even more manifest. When the producer knows the cost of production, the cost of marketing, and what methods of production and marketing are working out most economically in actual practice, he will be in a position to appreciate the work of the Farm Economics department.

A SASKATCHEWAN SOIL SURVEY

IN accordance with the recommendations of the Royal Commission appointed to enquire into the condition of the farming industry in the Province of Saskatchewan, the University is proceeding with a reconnaissance survey of the province.

Dean Rutherford, who was Chairman of the Commission, reports that during the first week in June, Professor Roy Hansen, of the Soils Department, with two senior students, left Saskatoon for the southwestern part of the province to begin work. The work this year is in a large measure of an experimental nature as the type of survey being made is a little different from the detailed surveys that are being conducted in the several States. It is intended to locate the large soil areas and to determine the boundaries of various soil types. Soils that cannot be determined accurately in the field will be sent to the laboratories at the University to be worked out during the winter time. Samples will also be sent in to the laboratories in order that the field determinations may be verified. Good progress has already been made, according to reports that have come in from Professor Hansen.

In addition to the soil survey, it is intended to make a fairly careful survey of the farming methods and operations prevailing in the district. This will not be a detailed farm management survey but rather a historical one, in order that there may be information at hand that will enable the University and the Department of Agriculture to determine methods that may lead to a more profitable, productive and permanent agriculture, especially for southwestern Saskatchewan. What is being done in the southwest will be done also in other parts of the province, until the whole area has been covered.

The method of carrying on the work next year will be based largely upon the experiences of this year. It is alto-

gether likely that more than one outfit will be engaged in the work in 1922, though this will be determined later.

Professor Hansen states that the work will consist of the examination of soils in the field by trained men. Maps will then be prepared showing the boundaries of the various soil types, the quality of the soil and the system of farming recommended. Sub-soils will be examined, since the power of a soil to withstand drought is in a large measure dependent upon sub-soil texture. A very careful study of the conditions affecting the various districts will be made, this study to include meteorological conditions, kinds and varieties of crops suitable to the area, crop rotations, the soils, the livestock situation, practices in vogue, etc. By a careful analysis of all the factors, it will be possible to point out the reasons for success or failure by which the farmer may be guided.

While the first aim will be to assist the farmer, other and secondary benefits will result. Schools, particularly where agriculture is taught, will find the information obtained from the soil survey of great value, both for purposes of teaching and for carrying on investigational work. The Agricultural College at Saskatoon, has especial need for this project. Where soil or climatic conditions vary, and it is found necessary to establish experimental farms to work out the problems of the community, the survey will show the type of soil characteristic to the district, and will assist in the selection of a representative tract. Banks, credit companies, insurance companies and other agencies directly or indirectly interested in agriculture, will unquestionably find the project very useful. A better understanding on the part of the financier or business man of conditions under which the farmer is working should greatly assist such organizations.

In countries like the United States, where similar investigations have been conducted over wide areas, it is found that the reports furnish no small part of the working knowledge of the county agents. The same is true in the province of Ontario in so far as surveys have been

completed. Information on Saskatchewan conditions will in a like manner be available to agricultural representatives. These the provincial agricultural department intends to establish, it is stated, as soon as practicable on a much more extended scale than hitherto.

AN AGRICULTURAL SURVEY IN THE PROVINCE OF QUEBEC

AS a preliminary step to a comprehensive study of the various problems of the farm, and in order to enable official agronomists to better shape their programme and do more efficient work, a thorough survey of the various methods of culture has been undertaken by the Quebec provincial Department of Agriculture. This survey was put in charge of a practical farmer, graduate of the school of agriculture of Ste. Anne de la Pocatière, Mr. C. Gagne, licensed in agricultural

science from Cornell University. Mr Gagne is now working, with the co-operation of local district agronomists, in a few counties below the river St. Lawrence, and, later on, the survey will be extended to other districts.

The agricultural survey planned by the Department includes a complete inventory of each farmer's personal and real estate; this inventory to be used at the end of each year to establish the net value of his assets.

COMMUNITY PACKING AND MARKETING OF APPLES

BY REVEREND FATHER LEOPOLD, DIRECTOR, OKA AGRICULTURAL INSTITUTE, LA TRAPPE, QUE.

COMMUNITY packing of apples is an important feature of many co-operative marketing associations that handle the fruit with success. Community packing, in charge of competent and disinterested men, makes it possible to secure uniformity in grading and packing the product of the members' apple orchards. Attractive labelling of the packages is an added feature in many instances.

Community packing and grading is correct in principle, but how are we going to work it out? If I might suggest a practical way, it would be to divide our fruit districts in so many

divisions, with a central packing shed in each, to be used for packing the apples grown in that division. For instance, take centres like Rougemount, St. Hilaire, Covey Hill, Abbotsford, Châteauguay, St. Joseph du Lac, in the province of Quebec. In the most of these centres the government spends money every year demonstrating the best methods of producing high quality apples. It is time now to spend the same amount in teaching the growers practical means of grading and packing their apples, and there is no better way of undertaking this than through community packing, which I advocate.

There is no use in speaking of one central packing house for the whole society, as we could not economically ship our apples to the one place for grading and packing. This would be much more simple but is impossible to attain in our scattered sections. But if one central house is not practicable, that is no reason to abandon the community packing idea. The solution is to build more houses. These packing stations need not be elaborate. All that is needed is a room to receive the apples as they come in, a packing room and a grading outfit. The house might well consist of a two-story building. It is not even necessary now, at least, to have a storage house, as the apples could be sent after packing to the Co-operative Centrale in Montreal, where there is every facility to store and handle the fruit. There is no difficulty whatever in disposing of

fruit that is well graded and packed. The difficulty always comes from the fact that the fruit coming in is packed in all sorts of ways, arriving very often slack and in a more or less bad condition.

The supervision of packing stations by inspectors or agents of the provincial government would then be an easy task. It would be their duty to see that the fruit sent in was properly graded and packed. In order to secure uniformity of grades, it would be necessary that pickers, graders and sorters should follow well-defined rules in picking and handling the apples in the orchards as well as in the packing houses.

The problem of marketing requires that the manager of the co-operative concern, as early as practicable in the season, should make a careful estimate of the production in the various districts.

BETTER FARMING TRAINS TOUR SASKATCHEWAN

DURING the month of June a Better Farming Train was run as in former years under the administration of the Department of Agriculture of the province of Saskatchewan. Sixty-five points were visited with a total attendance of 32,774 men, women, boys and girls. This train was made possible by the co-operation of the Canadian National Railway, the College of Agriculture of the University of Saskatchewan and the Department of Education.

The railway supplied the rolling stock and moved it from point free of charge to the Government. The College of Agriculture equipped the exhibit cars with live stock, display of machinery and farm mechanics, field crops, poultry and dairy exhibits. Also manned these various sections of the train with lecturers and students as attendants in exhibit cars.

The Boys' and Girls' lantern car was looked after by representatives of the Department of Education assisted by officials of that department. School Hygiene work was looked after by that branch of the Educational Department, while the Domestic Science Section and Nursery Car were staffed by outside help selected by the department. The staff of the train averaged about thirty, and arrangements were made with the railway as in former years for sleeper and dining car to be attached to the train.

This year an innovation was introduced in having the tree planting car of the Canadian Forestry Association attached to the train, and lectures by the men in charge proved to be a valuable addition to our programme.

Agricultural Instruction Train

A second train, known as the Agricultural Instruction Train, was operated

over Canadian Pacific railway lines in the southwestern part of the province during July. This was really a "better farming train" in miniature, the subjects dealt with being confined to live stock, dairying and field crops. Twenty-four meetings were held with a total attendance of over 4,300 persons.

Scrub Sires Exchanged for Pure-bred

One of the successful features of the train was the carrying of cars of pure-bred bulls of the leading breeds for sale

and exchange. These were sold to the farmers on credit terms, scrub sires being taken in part payment and removed. Twenty-one bulls were placed during the trip, and valuable demonstration work was done along the entire route by the carrying of such a variety of sires of the different breeds. Much interest was taken in the dairying lectures, and the work of cow-testing was greatly stimulated, farmers at practically all stops deciding to take this important step in building up their dairy herds.

AN INSTITUTE SCHOOL FOR COMMUNITY LEADERSHIP

BY G. A. PUTNAM, SUPERINTENDENT, WOMEN'S INSTITUTES OF ONTARIO

THE Women's Institutes of Ontario are the study centres, social as well as educational, of the home-makers of each community. Here in monthly gatherings which are non-sectarian, non-partisan, and recognize no class distinctions, they consider together how to attain better homes, better people, a better community, a better and happier social life, and a better and more scientific agriculture.

Within the rules, they are self-governing, the monthly programme being planned and carried out by the members themselves with the aid of suggestions from the Institutes Branch of the Department of Agriculture through the handbook and lecture staff.

The basic principle of action is co-operation. The women and girls of a community co-operate with each other in the branch institute; the branches co-operate in a district organization; also provincially in the annual conventions. All co-operate with the Institutes Branch of the department, from which they receive regular and efficient help in literature, lecturers, demonstrators, short

courses, and, through the colleges, loan material for the preparation of papers and demonstrations by the members themselves.

Through this simple, direct, and practical working trinity of the home-maker, college and department, remarkable results have been quietly achieved in the last twenty years. This machinery affords the medium by which the best services of all departments of the state and the results of college research can be put at the command of the home-maker in even the remotest parts, wherever the home-makers choose to organize. Over nine hundred points have so organized in rural Ontario.

The greatest obstacle to thorough and efficient organization has been the lack of leaders. Theoretically, every member in the branch institute takes her turn and does her bit in holding office, acting on committees, taking part in the programme, social and educational, and in the various general activities for the promotion of community welfare. Actually, while many do this, many others hold back. The cause for this,

investigation shows, is in most cases timidity arising from a lack of knowledge of what to do and how and when to do it.

To obviate this difficulty, in July of this year, a Women's Institute School for branch and district officers was put on at the Macdonald Institute, Guelph, running concurrently with the School for Rural Leadership, for one week, the students enjoying some of the same lectures and the social and recreational features of that side of the college life in addition to their own. The Institute School was in charge of the Superintendent and members of the provincial institute lecture staff, assisted by Miss Cruickshank of Macdonald Institute.

Although, owing to the shortness of time and limitations of accommodations, invitations to attend had to be confined to branches in the counties adjacent to Guelph, twenty-five registered for the week's course. Instruction was given by lecture, demonstration, and class discussion, the interest displayed being very keen.

The following outline gives some idea of the scope of the course:—

Historical Development of Agriculture and Country Life.

The Country Life Problem and the Answer.

The Family in Rural Life.

History of Women's Institutes: their Present Status and Relationship to Government Service.

Basis of Organization: Branch, District, Provincial.

Parliamentary Procedure, including Methods of Conducting Meetings, Elections, etc.

District and Branch Officers—Selection, Responsibilities and Opportunities.

Programme Planning in the Branch Institute.

The Girls in the Institute.

Responsibilities of the Home-maker.

Labour-Saving Methods in the Home.

Community Activities—

The School and Its Allies;

Play and Games in Relation to Community Well-being;

Community Halls and Libraries;

Community Singing.

Linking up the Institutes with the Services Available through the Various Departments of the Government: Agriculture, Public Health, Education, Labour.

MINISTER OF AGRICULTURE FOR SASKATCHEWAN

Mr. John Archibald Maharg has been appointed Minister of Agriculture in the Government of Saskatchewan, succeeding the Honourable Charles McGill Hamilton, resigned. Mr. Maharg, who is a director of the Saskatchewan Co-operative Elevator Company, was a

member of the House of Commons from 1917 until the present year when he resigned to accept the provincial portfolio.

Mr. Maharg, who is of Irish parentage, is a native of Dufferin county, Ontario.

PART III

School Agriculture and Related Activities

AGRICULTURAL EDUCATION IN CANADA

Address delivered at the Imperial Conference of Teachers' Associations
Toronto, August 10-13

BY J. B. REYNOLDS, M.A., PRESIDENT, ONTARIO AGRICULTURAL COLLEGE

AGRICULTURAL Education in Canada in the broadest phase of the term radiates in three directions from a common centre: there is vocational training for the business of farming, which phase will not be discussed as such in this paper; a second is education for agriculture and country life; a third is education through agriculture for a common citizenship.

The two purposes of education with which this paper will deal, namely, education for agriculture and country life, and education through agriculture, are accomplished, or attempted, by every grade of institution from the public school to the university. In most, if not in all of the Canadian provinces, some agricultural education is offered in the public schools under the provincial departments of education, and these include continuation schools and consolidated schools. In Nova Scotia, Quebec, Ontario, and Alberta, there are agricultural schools which combine the three purposes mentioned. Ontario and Manitoba has each an agricultural college, with its own staff of teachers and courses of study, while Quebec, Saskatchewan, Alberta, and British Columbia has each a faculty of agriculture within the university.

Agricultural Education in the Public Schools

A somewhat vague and unformed but persistent impression has prevailed in Canada that agriculture should be taught in the public schools. In the report of the Ontario Agricultural Commission published in 1881, the section on Agricultural Education has this to say:—

"It may be noticed, however, that both Mr. Mills¹ and Mr. Johnston² advocate the extension of our system of agricultural education beyond its present limits by introducing it into our public schools, and by establishing agricultural schools in the counties."

In a study entitled "Rural Schools in Canada" (1913), Dr. J. C. Miller reports:

"The one point at which each province professes to give some work of peculiar interest to rural children is in the courses in nature study and elementary agriculture, sometimes called 'Elementary sciences' or 'object lessons and familiar science' or 'useful knowledge.' The common judgment of the inspectors, taking the country as a whole, is that, with the exception of relatively few cases, this project is either ignored or

¹ President of the Ontario Agricultural College, 1879-1904.

² President of the Ontario Agricultural College, 1875-1879.

dealt with in an informal and haphazard way with quite unsatisfactory results. Nature study and elementary agriculture studied through books for the sake of passing examinations, are, however, gradually giving way before genuine efforts to make the work amount to something. Some provinces, particularly Manitoba, Ontario and Nova Scotia, are making a real effort to strengthen this course, in the rural schools especially. The greatest difficulty experienced by the provinces is to transfer the course of study, from paper into a reality in the experience of the teachers and children."

Two ideas relating to agriculture in the public schools seem to be struggling for recognition, and to be finding expression in the topics taught and in the methods of presentation. There is the idea that children born in the rural districts should be taught agriculture for vocational purposes in order that they may be the better fitted to follow farming as an occupation, and be less inclined to leave the country for the town. In the report of the Ontario Agricultural Commission already referred to, occurs this statement of opinion, which indicates that forty years ago in Ontario rural depopulation had already set in:

"Great indeed will be the advantage to Ontario if any means can be devised to correct the growing disposition of the rising population of our agricultural districts to forsake rural life for pursuits, already overcrowded, in towns and cities." Against the vocational purpose in rural education two strong protests have arisen: the one an educational protest, that elementary education should have no specific vocational purpose, but should prepare for the duties of a common citizenship. The other protest comes from the parents of rural children. They object to the assumption that because their children are born in the country, they must necessarily stay

there and be denied the opportunity of choice of occupation.

The second idea in agriculture for public schools is that since education is a preparation for life, local aspects of human industry, of human interests, and of social activities, may be effectively used by the teacher to illustrate and to enforce the lessons of the school. Useful knowledge is just as useful if gained by observation of the life in the school district as if gained from books about distant lands. Knowledge of geography, history, language, natural objects, natural phenomena, civics, industries, products, exports, imports, social laws, customs, and obligations, all may be taught by illustration and reference to local examples. Thus incidentally the intellectual and social interests, and the importance of agriculture and country life in the life of the nation and of the world may be revealed to the minds of rural children, just as similar interests and values in the town may be revealed to the minds of children there. This process of using local material for the education of rural children is an example of education through agriculture, and if applied understandingly, conserves the true purpose of education. At the same time this process is more likely to hold in the country those who by tastes and aptitude are fitted for farming and country life, than a formal attempt at vocational training could be.

The difficulties in the way of teaching agriculture in the public schools are mainly two: the lack of properly educated teachers and the inveterate habit of teaching from text-books and of following prescribed programmes to the neglect and exclusion of all local illustrative material.

Possible solutions for the education of teachers are, to introduce agriculture higher up, in the high schools and collegiate institutes, or else, to train teachers for rural schools at the agricultural college. Agriculture for high schools

will be dealt with separately. Teaching solely from text-books and according to a rigid programme is inveterate only with teachers lacking sympathy and vision. The teacher who has the "disciplined habit to see" the meaning and value of the busy life in the community about him

"Finds tongues in trees, books in the running brooks, sermons in stones and"—

good material for teaching in everything.

The essential factor of success in using the material offered by the garden, the farm, and the country side is the ability to find and interpret that material as illustration of the general principles laid down in text-books. A manual on school gardens, or on field crops, live stock, fruit-growing, weeds, insects, poultry, dairying, may be used as a general guide. But the point here is that to rely chiefly or altogether on text-books in teaching agriculture is to rob the subject of its distinctive character, and to reduce it to the level of the old-time scholastic subject. The distinctive character of agriculture as a subject of instruction in the public schools, and the justification for its introduction there, are that it deals with things rather than with books, and that it affords the opportunity to develop the powers of observation and judgment and the capacity to do things, rather than the faculties of imitation and repetition.

Space cannot be provided in this paper for statistics covering the teaching of agriculture in the public schools of Canada. Perhaps the extent of the work may be illustrated by some figures from Ontario, though doubtless Ontario has made more progress in this direction than most of the other provinces. Of 6,738 public and separate schools in Ontario, 1,648 schools taught agriculture in the year 1919-1920. The 1920 report of the Department of Education for Ontario quotes opinion from inspec-

tors, trustees, and teachers relating to the effect of this teaching. The general impression is that though the subject may be imperfectly taught it has had effects of undoubted value. It has quickened the interest of many pupils both in the general work of the school, and also in practical agriculture such as gardening, stock raising, and preparing farm products for exhibition. Skill in productive enterprises, a worthy pride in worthy accomplishments, the beginnings of scientific knowledge, and a new respect for agriculture both as an art and as a science are the results even of imperfect and somewhat haphazard attempts to teach agriculture in the public schools. When the teachers shall have a more thorough training in the principles of agriculture, and become better qualified to select and use the material at hand in every rural locality, agriculture will become a valuable adjunct to the scholastic subjects as an instrument of education of the young. "Education through agriculture".

Agriculture in the High Schools

In the report of the Ontario Department of Education already mentioned, Dr. Dandeno, Inspector of Elementary Agricultural Education, says:

"Notwithstanding the fact that excellent courses in agriculture—as far as can be given with the limited accommodation—are now being given in the Normal Schools, we can never hope to meet the needs of the Public Schools until the High Schools undertake the work as an essential part of the curriculum for teachers. This can be done only by providing for agriculture as a regular subject on the High School course of study."

The High School course of study is at present designed to meet two demands—that of a teacher's course and that of matriculation into the faculties of the universities—medicine, applied science, dentistry, or arts.

The Department of Education, in shaping the course for teachers, has thus far recognized agriculture only as an optional subject, while the university in prescribing courses that will admit students to its various faculties, has not recognized agriculture at all. This is true of the Ontario universities, and true of most, if not all, of the other provincial universities. In Ontario the agricultural college is not a faculty of the university but a separate institution, affiliated with the university for the purpose of conferring the degree in Agriculture. The Manitoba agricultural college stands in the same relation to the university there. Until 1919-20 in Manitoba, and until 1920-21 in Ontario, students had been admitted to the four-year course in the agricultural college without matriculation requirements. Matriculation is now required at both of these institutions. In Saskatchewan, Alberta, British Columbia and Quebec (Macdonald College) Agriculture is a faculty of the university. In Saskatchewan and British Columbia, Agriculture is an optional subject for matriculation. In Alberta, students may enter the degree course for Agriculture with ordinary matriculation, or from any of the six agricultural schools of the province.

A course in Agriculture covering four years of the high school period in Ontario is now being prepared (April 23, 1921). This course is the joint product of committees from the agricultural college and the Department of Education, and if approved by the university senate, will probably be an alternative subject for matriculation in Arts with elementary science in the Lower School, and experimental science in the Middle School. The course, as outlined, presents the following subjects:

Bacteriology.—In relation to foods, water, and infectious diseases.

Botany.—A functional study of root, stem leaf and flower. The economic

grasses: cereals, timothy, orchard grass. Fungi, and fungous diseases, such as oat smut, wheat rust, and black knot. Trees, identification, and study of common species.

Gardening.—Hot-beds and cold frames; growing early vegetables and small fruits; school gardens; planting bulbs.

Entomology.—Elementary and economic.

Dairying.—Milk testing; lactometer; food value of milk; use of milk separator.

Poultry.—Types and breeds, hatching and rearing chicks; poultry houses and poultry management, care of eggs; candling eggs.

Beekeeping.—Life history and work of bees; colony studies; swarming; construction of hives.

Chemistry.—Elementary; soil properties; chemical compounds; manures and fertilizers; insecticides and fungicides.

Physics.—Hydrostatics; drainage; farm mechanics; electricity for heating, lighting and power.

Farm Animals.—Types and breeds; comparisons of grade stock with pure bred.

Field Crops.—Types of farming; crop rotation; seed testing and seed-judging.

Surveys.—As time allows, district surveys of farm animals, crops, soil, types, etc.

This course, if accepted for matriculation in Arts (and also in Agriculture) will effect important results in the work of the high schools. It will be accepted also by the department of education in the course for teachers. It may be said that the Department of Education may accept it, and require it, even if it does not become part of the matriculation requirements. But the high schools will

not likely put in this course for teachers if an alternative is offered, and that alternative is required for the matriculation course. For the main work of the high schools of Canada is to prepare teachers for the public schools, and to prepare matriculants for the university. The alternative to agriculture being science as at present taught in the high schools, if agriculture will serve both for the teachers' course and for matriculation in arts, a number of high schools will doubtless teach agriculture to the inclusion of the alternative science course.

Teachers for rural schools will thus have the benefit of a course in agriculture, which in a more elementary form they will be prepared to teach in the rural schools. That will be one result, and another is equally important. Of all the boys and girls who enter the high schools of Canada only a small proportion remain long enough to secure matriculation or the certificate of teacher. For that large proportion who do not finish their high school course, some "educational agriculture" in that course will reveal to them the meaning, the value, and the interest in country life and country industries and occupations. I do not consider that instruction in agriculture, whatever form that instruction may take, is worth the time spent upon it if that instruction leaves the pupils cold or hostile toward country life; toward the interest and variety in the business of farming, and the

pleasures of working with growing things. A lively sense of rural values, of rural interests and rural opportunities are the results which should really be sought in teaching agriculture to the young. "Educational agriculture" is not merely learning how to handle a hoe or prepare a garden plot or feed a calf; nor is it merely nature-study; still less is it applied science; it may be all of these, but it is something more. It should develop tastes and appreciation of rural life and rural things, of the results of industry intelligently applied, of the beauty and the wonder and the power in the life of plants and animals, of rural sights and sounds and all the charm of nature. "Educational agriculture" is thus more than a body of knowledge, and more than manual skill. It is a point of view, a sense of values, which will lead boys and girls back from that path to the city where for most of them neither happiness nor usefulness can be found, back towards the open country which needs only a sufficient number of rightly-trained people to make it a more desirable place of residence than the town, toward which our educational and social ideals have too long been directing Canadian youth.

If we can find teachers who can be made to believe this, either for the high schools or the public schools, the problem of agricultural education for the schools will be solved, and it will not be solved without such teachers.

[To be continued.]

INTER-TOWNSHIP STOCK JUDGING COMPETITION

WELLINGTON county, Ontario, has taken a forward step in the training of young men for the judging of live stock by the holding of an Inter-township Judging Competition. The competition was held at the Ontario Agricultural College on June 10, having been organized by the Agricultural Representative, with the hearty

support of the county and township councils, and the farmers' clubs.

Seven townships entered teams, each consisting of five men under twenty-five years of age. The classes judged consisted of two classes of each of the following: heavy horses, beef cattle, dairy cattle, sheep, and swine. The men composing the teams had been

carefully trained by local live stock breeders selected by the township councils. In the training, the men were taken from farm to farm for three to four months previous to the contest, where actual judging was carried on under the direction of their respective trainers. The Wellington county council provided the prizes, which consisted of a \$50 silver cup, five silver shields, five silver medals, five bronze medals.

The contest consisted of placing the animals according to merit and the giving of reasons orally for the decisions made. The contest was in charge of Mr. R. H. Clemens, agricul-

tural representative, assisted by Professor Wade Toole of the Agricultural College and Mr. W. D. Jackson, Assistant Director of the Agricultural Representative Branch of the Department of Agriculture at Toronto. The keenest interest was shown, upwards of six hundred residents of the townships represented, including the parents and friends of the competitors, being present at the college to witness the contest. The judges were all practical farmers and stock breeders from points outside of the county. The silver cup was won by the Puslinch township team with a total of 3,694 points out of a possible 5,000.

DEMONSTRATION TEAM COMPETITION

About 250 demonstration teams representing Boys' and Girls' Clubs in the province of Manitoba, are carrying on local competitions to ascertain which of them shall meet in the provincial competition to take place at the Garden Show to be held in Winnipeg this autumn. The competitions for the Girls' Clubs include, among other things, canning, cooking, millinery, and the growing of potatoes. The provincial contestants will be subject to the following rules:—

1. Each team is to consist of three members, a captain and two assistants.

2. Each competing team will put on one 45- to 60-minute demonstration.

3. Demonstrations may include such subjects as the following: Canning, garment, dyeing, baking, sewing, home decorating, textiles, vegetable judging, milk testing and laundering.

4. Each team is expected to wear a distinct uniform for the occasion.

5. Each member of the canning teams will be required to forward twelve jars for exhibition at the Garden Show.

UNIVERSITY WEEK FOR FARM YOUNG PEOPLE IN ALBERTA

BY ALBERT E. OTTEWELL, DIRECTOR, DEPARTMENT OF EXTENSION, UNIVERSITY OF ALBERTA

DURING the week June 8-14 inclusive, there was held at the University of Alberta, Edmonton, the third annual University Week for Farm Young People. Altogether one hundred and sixty-four young

people were in attendance, eighty-seven boys and seventy-seven girls. These were from the farms in all parts of Alberta, seventy communities being represented. An age limit of sixteen to twenty-five was imposed.

The conference, the third of its kind in Alberta, was a co-operative undertaking in which the United Farmers of Alberta and the United Farm Women of Alberta promoted the attendance, drawn almost entirely from the branches of their organizations, and more especially from the Junior Locals. The University of Alberta, through the Department of Extension and the College of Agriculture, undertook to provide the programme, and residence accommodation was provided in the residences of the university. A wide variety of material was presented in the programme, ranging from practical agriculture in field husbandry, animal husbandry, poultry, dairying, and the history of agriculture, to physical education for both boys and girls, amateur dramatics, history and citizenship. Two special features were a grand field day for athletic competitions and a concert, where the major part of the programme was furnished by the young people

themselves, who had been trained during the week. Both the Y.W.C.A. and the Y.M.C.A. helped greatly with the undertaking by lending the services of the provincial field secretaries for boys' and girls' work.

The residence arrangements were on the group plan and a keen competition ran through the week in which points were awarded groups for almost every side of their work, from the neatness of rooms which both boys and girls cared for themselves, to punctuality at meals and lectures. It is intended that the group numbers will be perpetuated for successive years and a tradition established to maintain or improve their respective records.

The activities of the week concluded with a banquet at which toasts were proposed and responded to by the young people, and a social evening featured by the introduction of folk dances and games suitable for community gatherings.

HOME-MAKING COURSE FOR GIRLS IN NEW BRUNSWICK

THE Superintendent of Women's Institutes for the province of New Brunswick, Miss Helen J. Macdougall, reports that a short course for girls in home-making was held at the Agricultural College, Truro, July 12 to 22, 1921. Twenty-two students registered and the course was an outstanding success in every way. The subjects taught included cookery, food values, table setting and serving, canning fruits and vegetables, dressmaking and basketry. Demonstrations and talks on the menu under consideration were held at the beginning of each session. The class then divided, one half of them preparing the meal and the other half taking instruction in dressmaking. The next session the class were reversed and

those who had been cooking, formed the dressmaking class.

Every effort was made to make the course as practical and attractive as possible. Instruction in the manipulation and cookery of the staple food stuffs and the planning and preparing of simple meals was the work of the cookery class. In addition, the girls made all the bread which was used during the course, with the exception of the first day, as well as all other bread stuffs, such as biscuits, rolls, cakes, cookies, etc.

We were fortunate in being able to rent a large house where the out-of-town students were in residence during the course. These girls had the opportunity of preparing and serving their own breakfasts and also had the care of the

house and their rooms. The evenings were devoted to basketry.

Tuition was free, but the girls paid for the materials used in preparing their meals, and for the rent of the house. This came to considerably less than regular board, so that the expense of the course was reduced to a minimum.

The closing day of the course, an exhibit of the work in dressmaking, basketry and canning was held. The pub-

lic was invited and large numbers attended. They found it difficult to believe that in the short space of time, such a splendid exhibit of work could have been prepared by young girls. The quality of the work was excellent, and the display was most attractive. Miss Elizabeth Ellis and Miss Eleanor Sugatt of Truro, and Miss Mary Dee of Halifax, Instructor in Dressmaking, assisted Miss Macdougall.

PART IV

Special Contributions, Reports of Agricultural Organizations, Publications and Notes

NEWS ITEMS AND NOTES

The Department of Agriculture of the province of Quebec recently made several additions to its staff of district agronomists. The province now has 49 agronomists and 19 assistants.

A convention of district supervisors of the Manitoba division of the Soldier Settlement Board held a two-day conference at Winnipeg. The purpose of the conference was to arrive by discussion at the best means of carrying forward the work of assisting soldier settlers to improve their land and becoming successful farmers.

Mr. Wm. B. Varley, Assistant to the Commissioner under the Agricultural Instruction Act (Dr. J. H. Grisdale acting), visited the Western Provinces during the month of July in the interest of the work. Mr. Varley also represented The Agricultural Gazette, with which he has been connected for some months as Acting Editor.

An official statement issued by the Bureau of Crop Estimates of the United States Department of Agriculture, places the Marquis variety of wheat in the leading position in the spring wheat belt, which includes Minnesota, North and South Dakota and Montana. The report states that Marquis was least important in 1914, but in 1916 it had jumped into first place and has held this position since.

The Canadian Wheat Board, which was responsible for the handling of the 1919 wheat crop of Canada, did business to the extent of about ten million dollars. According to the statement of the chairman of the Board, Mr. James Stewart, the cost of administering the Board, including general expenses, auditing, registration of participa-

tion certificates, payment of participation certificates, collection of assessments, statistical, and all other branches, will have cost less than one-half cent per bushel of the grain handled by the Board.

For the purpose of extending the market in Great Britain for Canadian wools, Mr. G. E. O'Brien, general manager of the Canadian Co-operative Wool Growers, Limited, took to England samples of all classes and grades of Canadian wool to be placed before the English wool trade. A further purpose of Mr. O'Brien's visit was to select a suitable firm of wool brokers to act as selling agents for Canadian wools on the Bradford wool market.

The Canadian Ayrshire Breeders' Association have employed a fieldman in the person of Mr. J. T. Clement. Mr. Clement, who spent five years in Record of Performance work with the Department of Agriculture, Ottawa, will spend his time in the advancement of the Ayrshire breed throughout Canada.

The export of foxes from Canada to the United States last year was 805, as compared with 335 the previous year.

The Ontario Government has established a cold storage warehouse for apples at the town of Brighton. This warehouse is established as an experimental and demonstration enterprise. The building will be fitted with refrigeration machinery. The primary purpose of the building is the pre-cooling of summer and fall apples. It is expected it will be available also for the storage of the later crop grown by orchardists in the neighbourhood.

The Board of Directors of the Royal Agricultural Winter Fair have decided to adopt a new policy with respect to the distribution of prize money at their first show to be held at Toronto at the end of November this year. Instead of graduating the prizes, as is the custom at fairs generally, equal prizes will be given in each section. That is to say, all winners will receive an equal share of the prizes set apart for that section. Competitors, however, will be placed in the order of merit and receive corresponding distinctive ribbons or cards.

Co-operative shippers of Grey County, Ontario, have adopted a system of making returns that has simplified their transactions. Seven clubs send out each week from one to three carloads of stock through a local shipper. The returns on each transaction are divided between the individual owners of the stock by the U.F.O. agency at the Toronto stock yards, and the whole is paid into the bank in Grey County, which issues cheques to the individual owners. These clubs charge each farmer shipping the stock five cents per head on sheep and hogs and 10 cents per head on cattle, to provide a reserve fund and insure against loss.

The Manitoba Department of Agriculture held conferences of the municipal weed inspectors at Winnipeg, Brandon, Minnedosa, Dauphin and other points, in the months of May and June. The Winnipeg meeting was attended by the Commissioner of Agriculture for Minnesota and the Weed Inspector for that State, which led to consideration being given to the adoption of uniform methods for weed control on both sides of the international boundary, where weed problems are naturally similar.

A Boys' Live Stock Judging Competition was held at Brandon Fair this year for the first time. The training of the several team that competed was largely the work of the agricultural representatives stationed throughout the province. All classes of live stock were judged.

Upwards of four carloads of grade Holstein and Ayrshire heifers and cows, ordered by farmers in Saskatchewan, are being supplied through the Live Stock Branch of the Provincial Department with stock purchased in Ontario and Quebec.

The Saskatchewan Department of Agriculture held a series of forty-three meetings throughout the province, chiefly for the purpose of acquainting the farmers of the province with the methods and advantages of marketing live stock on the co-operative plan.

Four members of the staff of the Ontario Agricultural College have entered upon courses of study in agricultural colleges in the United States with the view of obtaining the degree of Master of Scientific Agriculture. Mr. J. Coke, lecturer in Farm Economics, is pursuing his studies at the College of Agriculture of the University of Wisconsin. Mr. D. R. Sands, lecturer in Botany, and Mr. E. S. Snider, an official of the Poultry department, are also taking special work in their chosen branches at this institution. Mr. J. P. Sackville, Assistant Professor of Animal Husbandry, is specializing in Dairy husbandry at the Agricultural College at Ames, Iowa, and Mr. E. W. Kendall lecture in Manual Training, is improving his knowledge of farm mechanics in Detroit, which is the centre of the motor industry.

Mr. W. R. Graham, Professor of Poultry Husbandry at the Ontario Agricultural College, was one of the instructors at the Fourth Annual Poultry Judging and Breeding School held at the New York State College of Agriculture from July 4 to 9. Professor Graham gave instruction and demonstrations on the score card in judging for egg production, judging meat type by the score card and comparison. Professor Graham also assisted in conducting a judging contest between students, and acted upon a committee appointed to work out a standardization of methods of judging fowls for egg production.

ONTARIO PLOUGHING MATCH AND MACHINERY DEMONSTRATION

The Ontario Plowmen's Association will this year hold its International Ploughing Match, Tractor and Farm Machinery Demonstration from October 19 to 21 at the city of Woodstock. The demonstration, which is held at a different point each year, is directed by Mr. J. Lockie Wilson, of the Ontario Department of Agriculture, Toronto. The attendance at this gathering usually averages from 40,000 to 50,000, and the benefit to the younger farmers of the province, states Mr. Wilson, is most pronounced. All classes of implements and power machines will be in operation, and the ploughing contest is open to the farmers of the United States and Canada.

CO-OPERATIVE SHEEP DIPPING

The co-operative principle is being applied to the dipping of sheep in Brant county, Ontario. Following a dipping demonstration given last season in that county by the Dominion Live Stock Branch, the Brant Sheep Breeders' Club purchased a complete portable dipping outfit. This was used in dipping some sixty flocks, comprising twenty-four hundred head, in the month of June

this year. The flocks were brought to nine central points, where the dipping was done at a cost of four cents a head. It is the intention of the club to continue dipping twice annually, in the months of June and October.

SASKATCHEWAN AGRICULTURAL CONFERENCE

The second annual agricultural conference conducted by the Department of Agriculture of Saskatchewan was held at Estevan before the end of June. The main object of the conference was the bringing closer together of the farmers of the province and the college of agriculture, to study agricultural problems. The conference was called and directed by the Deputy Minister of the Department.

The principal speakers were: Mr. F. H. Auld, Deputy Minister of Agriculture; Hon. J. A. Maharg, Minister of Agriculture; W. J. Rutherford, Dean of the provincial College of Agriculture; Mr. G. H. Hutton, head of the agricultural and animal industry department, Canadian Pacific Railway; Mr. John Bracken, Principal of the Manitoba Agricultural College; Professor M. Champlin, Professor of Field Husbandry of the University of Saskatchewan; Professor Harrington, also of the College of Agriculture; Mr. J. F. Booth, Director of the Co-operative Organizations and Markets Commissioner, and others.

The programme consisted of addresses and discussion upon such important topics as diversified farming of a permanent character; meadows and pasture crops; soil drifting and its control; the summer fallow and suggested substitutes; silo construction and the growing of crops for ensiling; co-operative marketing.

DAIRY COMPETITIONS FOR SASKATCHEWAN

The Department of Agriculture of Saskatchewan, in co-operation with the Saskatchewan Dairy Association, is carrying on three principal competitions this year with a view to encouraging the owners of dairy herds to give greater attention to the production of their cows. The contests include the Greater Average Production Competition, the Record of Performance Competition, and the Keeping of Records of Milk and Butter-fat Production. The Greater Average Production Contest, which has been carried on for the last three years, was described in the May-June Gazette on page 330. The Record of Performance and the Production Record contests are new this season. In the Record of Performance competition two silver cups have been provided. One is available to the owner of the Ayrshire cow or heifer showing the highest standing for her respective age

or class, and the other to the owner of the Holstein cow or heifer judged on a similar basis.

SASKATCHEWAN TO EXHIBIT LIVE STOCK AT CHICAGO AND TORONTO

The Saskatchewan Live Stock Board, in co-operation with the provincial Department of Agriculture, has made provision for sending live stock exhibits to the Chicago International and the Toronto Royal shows this year. Live stock owners in the province are invited to participate in this display, which is likely to include Clydesdale, Percheron, and Belgian horses, beef cattle of various breeds, Oxford, Shropshire and Suffolk sheep, and Yorkshire and Berkshire swine.

As an inducement to the breeders to make thorough preparation for these displays, the Saskatchewan Department of Agriculture is awarding to each exhibitor who wins a grand championship prize, \$500; for reserve championship, \$300; either senior or junior championship, \$200; and reserve senior or junior championship or first prize in either open classes or breed specials, \$100. Not more than one of these prizes, however, can be won for the same animal.

The department will provide free transportation for the stock, which will be assembled at Regina at the time of the sheep and swine show in November, and shipped from there direct to Chicago, from Chicago to Toronto, and then back to Regina.

TESTING MILK AND CREAM

New regulations respecting the testing of milk and cream at creameries in the province of Nova Scotia came into effect on the first of June this year. Regulations have been authorized by Order in Council to the following effect:—

1. Every creamery purchasing or handling milk or cream and testing the samples daily shall keep or cause to be kept until noon the day following the day on which the tests are made a sufficient amount of the original unchanged sample of such milk or cream as is required for the purpose of retest.

2. Composite samples of milk or cream shall be kept from the time the test was made unadulterated, closely stoppered and in a cool place for a period of fifteen days from and not including the day on which such composite samples were tested.

3. Any Dairy Inspector, appointed under the Act, shall have the right to take samples of cream for testing out of any patron's can either at the farm, while being transported to the creamery, or while at or in the creamery or any time previous to the cream being mixed with other cream.

4. Any Dairy Inspector, appointed under the Act, shall have the right to examine and retest all samples and composite samples as mentioned in regulations 1 and 2, and shall

have access to same at all reasonable hours and may by written consent release the holding of samples as mentioned in regulation 2 at any time before the fifteen days have expired.

5. Any "patron" may demand and get delivery of the composite sample of his milk or cream delivered or sent by him, providing a previous order has not been given by the Dairy Inspector to have same destroyed.

6. Every creamery shall provide at least two composite sample bottles for each "patron."

BEE-KEEPING DEMONSTRATIONS IN MANITOBA

The Department of Agriculture of the province of Manitoba held bee-keeping demonstrations at a number of points in the month of July. The demonstrations were in charge of Mr. L. T. Floyd, the newly-appointed Provincial Apiarist, and took place at the homes of the bee-keepers who operate their plants in modern fashion. In addition to the demonstration of seasonable activities the question of wintering was thoroughly covered in some instances. At the meeting held in the apiary at Dominion City, it was stated that among the strongest colonies were those wintered outside in packing cases. The success of bee-keeping in Manitoba was shown by a bee-keeper at St. Jean, who reported that from a stray swarm he claimed six years ago he had now 76 colonies, and last year sold more than two tons of honey. The handling of "out apiaries" was demonstrated at the home of the President of the Manitoba Bee-keepers Association, Mr. G. M. Newton, who operates about three hundred colonies. A feature of the meetings was the opening of the hives and handling of the bees without veils.

COMMUNITY CENTRE MOVEMENT IN BRITISH COLUMBIA

At several rural points in the province of British Columbia action has been taken to provide suitable meeting places for social and business occasions. At Sardis, after a canvassing campaign on the part of a number of public-spirited citizens, it was decided to form a joint stock company of limited liability to build and manage a community hall. The organization is known as the Sardis Community Hall Company, Limited. The stock shares are valued at \$10.25 each. Having raised \$4,000 on the sale of shares, a hall 36 by 94 feet was erected. This includes a main hall 35 by 60 feet with a raised stage and dressing rooms; also a kitchen and two cloak rooms. The building adjoins the public playgrounds, where games can be witnessed from a balcony of the hall. A movement is under way at Fairfield Island and Cortez Island for the providing of similar

halls. At the former point, locals of the United Farmers have voted in favour of a community building. At Cortez Island the Farmers' Institute is behind the movement and has gone so far as to undertake the construction of a building.

MACDONALD COLLEGE—NOTES

Mr. M. A. Jull, M.Sc., Manager and Lecturer in Poultry Department, has just returned to the College after spending nine months (one college year) in the Department of Genetics, at the University of Wisconsin, Madison, Wis., in postgraduate studies leading to the Ph.D. degree.

Miss M. E. Kennedy, B.A., Assistant in Bacteriology, had the degree of M.Sc. conferred upon her by McGill University, following postgraduate studies undertaken in Bacteriology at Macdonald College.

Mr. E. M. Du Porte, B.S.A., M.Sc., Lecturer in Entomology and Zoology, has received the degree of Ph.D. from McGill University, following postgraduate studies in Invertebrate Morphology and in Parasitology.

Mr. L. G. Saunders, B.S.A., Halifax, N.S.; has received the degree of M.Sc. from McGill University after postgraduate studies in Entomology.

Mr. Saunders was also nominated by McGill University for the Science Scholarship granted by Her Majesty's Commissioners for the Exhibition of 1851. These scholarships, of the value of £200 sterling a year, are tenable for two or, in rare instances, three years. They are limited, according to the Report of the Commission, "to those branches of science such as physics, mechanics and chemistry, the extension of which is specially important for our national industries." Their object is not to facilitate ordinary college studies, but "to enable students to continue the prosecution of science with the view of aiding in its advance or in its application to the industries of the country. It is open to students of not less than three years' standing, who have shown evidence of capacity for original research, and is tenable at any university or other institution approved by the Commission."

Mr. J. B. McCarthy, B.A., M.Sc., Assistant Professor of Chemistry, completed the requirements for the degree of Doctor of Science, which was conferred upon him in absentia at the Convocation of the University of King's College, Windsor, N.S.

Twelve demonstration flocks of chickens were operated in Quebec by the Poultry division of Macdonald College in 1920. These served as partial sources of hatching eggs for school fair work and as community breeding centres for the distribution of pure stock. Demonstrations and lectures were given at farmers' meetings on the culling of

laying and breeding flocks, egg-marketing, and the preparation of poultry for market.

The Pomological and Fruit Growing Society of the province of Quebec has established a packing house for apples at the town of Chateauguay for the use of local growers.

PRINCE EDWARD ISLAND NOTES

Owing to the dissolving of the Brick and Tile company, the Department found it necessary to take over the operation of the company's plant near Richmond. A sufficient quantity of tile will be manufactured to maintain the operations of the ditcher throughout the season, as well as other demands.

The limestone quarry has been re-opened, and a new engine installed. Many enquiries are being received for delivery of pulverized limestone later in the season. The encouragement for the more general use of such material will come with several tests, which are being given in different parts of the province.

The growing of clover for seed has received a set-back with the dry condition of this season and has suffered as well from several late frosts, which visited the province during the latter part of May. The western part of the province has been carefully surveyed with a view to operating the clover huller during the latter part of the season, and prospects are only average at the present time.

The competition for the promotion of dairying, which was instituted for the first time in 1920 and which received favourable consideration from the milk producers, has again started for this season. The work is under the charge of a dairy instructor and is receiving a more favourable consideration than formerly. The dairy instructor spent the early part of the season in visiting the factories and reports favourably on an increased production over former years.

Approximately one hundred and seventy-five schools will participate in school fairs this season. A number of clubs have had

day-old chicks distributed to them at cost. Pig clubs have purchased pigs on a note payment.

THIRD INTERNATIONAL GRAIN AND HAY SHOW

The Third International Grain and Hay Show, which is held in conjunction with the International Live Stock Show, will take place on November 26 to December 3, at the Union Stock Yards in Chicago. The classification includes corn, oats, barley, wheat, soy beans, cow peas, field peas, rye, kaffir and milo corn, and small seeds. For the purposes of this show the United States and Canada have been divided into six regions from which entries may be made. Canada is represented in Regions 1 and 2. Region No. 1 includes all of the Dominion except the south-western portion of Ontario bounded on the north by a line drawn straight west from Toronto to Lake Huron. This region also includes the states of Washington, Oregon, Montana, Idaho, Wyoming, and North Dakota and the western half of South Dakota and Nebraska, the northern two-thirds of Minnesota, northern half of Michigan and Wisconsin, all of Maine, New Hampshire, Vermont, and Massachusetts, northern half of New York. Region No. 2, including the south-western counties of Ontario, takes in South Dakota, the southern third of Minnesota, southern halves of Michigan, Wisconsin, and New York; also Connecticut and Rhode Island.

The competitions provided in which Canada may take part are as follows: Corn, ten ears, single ear; Flint corn, ten ears; wheat, oats, rye and barley, each one peck; hay, one bale of not less than 50 lbs.; kaffir and milo, 10 heads; small seeds, including red clover, alsike clover, sweet clover, alfalfa and timothy, each four quarts; cow peas and field peas, one peck; and ten ears of corn of any variety open to members of corn clubs.

Towards premiums for this show the Chicago Board of Trade offers \$10,000.

Full particulars may be obtained by applying to the Superintendent, International Live Stock Exposition, Grain and Hay Show Department, Union Stock Yards, Chicago, Ill.

APPOINTMENTS AND STAFF CHANGES

Mr. F. C. Nunnick has been appointed Chief of the Division of Extension and Publicity, Experimental Farms Branch. Mr. Nunnick, who was connected with the Commission of Conservation as Agricultural Adviser from December, 1910, until the time it disbanded, gained his knowledge of farming on his father's farm in Brant county, Ontario, which he managed for over six years. After graduating from the Ontario Agricultural College in 1910, he served for a time on the staff of agricultural representatives of the Ontario department. While on the staff of the Conservation Commission he directed the agricultural surveys made by that body, which were the first of the kind undertaken in Canada. He also supervised the work in connection with the 35 illustration farms started by the Commission in 1912, and taken over by the Dominion in 1914, as well as the "Illustration County" undertaking. Mr. Nunnick will have charge of the exhibition work and the general supervision of the Extension and Publicity work of the Experimental Farms System.

Mr. H. R. McLarty, M.A., of Ridgetown, Ontario, has been appointed to the position of Plant-Pathologist-in-charge of the field of laboratory about to be established at Summerland, B.C., by the Division of Botany of the Experimental Farms Branch.

Messrs. J. T. Hockey and P. M. Simmonds, recently graduated from Macdonald College, have been appointed as Assistant Plant Pathologists at the Division of Botany's Branch laboratories at St Catharines and Saskatoon respectively.

W. R. Leslie, a graduate of Manitoba Agricultural College, has been appointed superintendent of the Dominion Experimental Farm at Morden. He has until now been in charge of the Ontario Provincial Government station at Fort William. Morden is an important point, as very extensive work in horticultural research is being carried on there.

Mr. Leslie will replace E. M. Straight, who has been in charge of the Morden farm since its inception. Mr. Straight becomes superintendent of the Dominion farm at Sydney, Vancouver, B.C., in place of Lionel Stevenson, who has resigned to accept a position in the Ontario Department of Agriculture.

Lionel Stevenson, B.S.A., has been appointed Secretary and Supervising Director of the Ontario Department of Agriculture. This position combines the former position of Secretary, which has been vacant for some time, and new duties to bring about a greater co-ordination and co-operation in the work of all branches of the Department. It will be the duty of this officer to assist men in all branches in planning and carrying out work, to keep in touch with all the activities in the field, and be a connecting link between the different branches both in strengthening present work and developing new lines.

Mr. Stevenson has had training and experience which admirably fit him for the duties he will be expected to discharge. He is a son of Mr. R. S. Stevenson, of Ancaster, one of the best known farmers and live stock men in the province. He graduated from the Ontario Agricultural College in 1912 and immediately took a position as Professor of Agriculture at the Agricultural College at Truro. After filling this position for a year he went to the University of Illinois and took his M.S. degree. Afterwards he was appointed Superintendent of the Dominion Experiment Station at Sidney, B.C., and he has held this position up to the present time.

Mr. S. R. N. Hodgins, B.S.A., has been appointed to the staff of Macdonald College as Instructor in Journalism.

Mr. W. H. Howitt, B.S.A., joined the Macdonald College staff, on February 1, as Lecturer in Horticulture. He is a graduate of the Ontario Agricultural College, has had experience in the extension service of the Horticultural Branch of the British Columbia Provincial Department of Agriculture and at the Ontario Agricultural College.

Mr. J. R. Almey, B.S.A., has been added to the staff of the Agricultural Extension Service of the Manitoba Department of Agriculture. Mr. Almey will for a time devote his time to general horticultural work, more particularly in relation to potato and vegetable growing, co-operative marketing, standardizing of varieties and other problems of the gardener.

The British Columbia Department of Agriculture announces the appointment, as district poultry inspectors for the lower

mainland and southern interior of the province, of Mr. W. W. Traves, a graduate in agriculture from the University of British Columbia, and Mr. Charles Good, a recognized poultry judge who has occupied important positions on large poultry producing farms.

Mr. R. C. Treherne, who for some time past has occupied the position of Entomo-

logist for British Columbia, representing the Dominion Entomological Branch, has been appointed chief of the division of Field Crops and Garden Insects at Ottawa. While in British Columbia, Mr. Treherne built up an excellent organization and, with the co-operation of the provincial department, established field laboratories at different points in the province. He will take up his new duties in October.

ASSOCIATIONS AND SOCIETIES

THE CANADIAN SOCIETY OF TECHNICAL AGRICULTURISTS.

The Canadian Society of Technical Agriculturists held its first annual convention at Winnipeg the end of June, with a registered attendance of seventy-one. Mr. L. S. Klinck, President of the University of British Columbia, and president of the Society, expressed the feeling of the executive that the time has arrived for an energetic prosecution of the aims and objects of the organization. He extended an invitation to all technical agriculturists to take an active part in the determining of the Society's policies and in the giving of the fullest effect to them. He set down three issues requiring urgent attention, namely, (1) Agricultural education, in the broadest acceptance of that term; (2) Agricultural policies—Dominion, Provincial, and College, and (3) Organization of technical agriculturists from the standpoint of the individual as well as that of the profession.

Mr. F. H. Grindley, General Secretary of the Society, reported a membership of 557, distributed in the nine provinces, with 11 in the United States and 3 in foreign countries. Thirteen local branches have been formed, including at least one in each province.

An amendment made to the constitution and by-laws, relating to membership, provides for three classes, regular, associate and honorary.

1. A regular member must be (a) A graduate in agriculture from a university or college of recognized standing; (b) A graduate of a university or college who is engaged primarily in agricultural research, administration, education, extension work, publicity, experimental problems, or other forms of allied work of a scientific or managerial nature; or (c) a non-graduate who is engaged primarily in agricultural research, administration, education, extension work, publicity or experimental problems and be accepted as provided for in the by-laws.

2. Associate membership shall be open to those engaged primarily in agricultural research, administration, education, extension work, publicity or experimental problems, who are not at the time eligible for regular membership, and to the undergraduates of agricultural colleges. Members of this class must be accepted by the Dominion Executive. They shall have no voting powers.

It was decided to continue the annual membership fee at \$10.

The Publications Committee arranged for in the original constitution is to be discontinued, and an editorial board substituted.

In addition to the regular business of the convention the programme included reports of the committee on research, and on marketing education.

The next annual convention is to be held in Montreal.

The following officers were previously elected by mailed ballot:—President, L. S. Klinck, President of the University of British Columbia; First Vice-President, H. Barton, Professor of Animal Husbandry, Macdonald College; Second Vice-President, John Bracken, President Manitoba Agricultural College; General Secretary-Treasurer Fred H. Grindley, Gardenvale, Que.

THE CANADIAN SEED GROWERS' ASSOCIATION

The Canadian Seed Growers' Association, which has been in operation since 1904, was on June 20, 1920, incorporated under the Companies Act as a recognized business unit. The members of the company are:—Dr. James W. Robertson, Ottawa; Dr. C. A. Zavitz, O.A.C., Guelph; Professor T. J. Harrison, Manitoba Agricultural College, Winnipeg; Mr. Narcisse Savoie, Secretary, Department of Agriculture, Quebec, and Professor Robert Summerby, Macdonald College.

The company in its new form will continue the work of advancing the interests of seed growers and other farmers by:

(1) Making regulations respecting the growing, selecting and preserving of seed of various kinds of farm crops for the guidance of its members;

(2) Causing records to be kept of the history of seeds produced by members;

(3) Fixing standards for seeds that may be eligible for registration;

(4) Publishing information as to standards;

(5) Issuing certificates of registration to members by which hand-selected seed or the product thereof may be distinguished from other seed;

(6) Such other means as may be expedient from time to time.

The operations of the corporation are to be carried on without share capital throughout the Dominion of Canada and elsewhere by the name of "The Canadian Seed Growers' Association," and the chief office of the said corporation is to be at the City of Ottawa. The secretary is Mr. L. H. Newman, Ottawa.

FEDERATED WOMEN'S INSTITUTES

The second biennial convention of the Federated Women's Institutes of Canada met at the University of Alberta, Edmonton, June 20 to 25. The provinces were nearly all represented, there being two delegates from each. Reports of the conveners of the several committees constituted an important part of the programme. Mrs. Laura Rose Stephen in reporting for the Agricultural Committee urged that the aim of women's institutes should be to make attractive rural occupations and social life. Mrs. W. W. Baird, convener of the committee on Household Economics, contended that amongst the greatest drawbacks to life in the country are the lack of conveniences in the home, bad roads, lack of social and community life, and isolation. Resolutions asking for greater progress in road improvement followed Mrs. Baird's report.

The report on Education and Better Schools prepared by Mr. George A. Putman, Superintendent of Institutes for Ontario, contained a brief summary of the progress that had been made in education in the various provinces. In Alberta, educational loans are available to assist students in financing their normal courses, teachers' residences in rural districts are provided; child welfare stations have been established; physical culture is taught; school gardens are encouraged, and free seeds given for home gardens; and school fairs are held. Sixty consolidated schools in the province had increased the attendance one hundred per cent in some cases. In Saskatchewan similar undertakings are carried on; a play and playground equipment bulletin is issued; Boys' and Girls'

Clubs were directed by the Department of Education. In Ontario the new outstanding moves have been in the direction of encouraging higher salaries for teachers, the providing of medical and dental inspection of schools, and hot lunch coupled with instruction in domestic science. Quebec was reported as making progress in the teaching of French in the English schools and English in the French schools. In New Brunswick medical inspection is in practice, and a general improvement in the school conditions was reported. In Nova Scotia the system of travelling teachers was referred to, as well as the work accomplished by women's institutes in beautifying the school grounds, introducing the hot lunch idea and the supervising of school playgrounds.

Mrs. Alfred Watt, convener of the Committee on Institute Technique, reported that women's institute schools were being held in three provinces—Manitoba, Ontario, and Alberta.

It was decided to do away with the standing committee on national publicity and to entrust the work to the publicity secretary. Provincial conveners will be responsible for provincial news.

Resolutions passed recommended the inauguration of a women's division of the Federal Department of Agriculture; that the expenditure of funds be confined to institute organization and to the furtherance of aims and objects as specified in the constitutions, and that institutes should guard against degenerating into money-making institutions; that the Federated Women's Institutes should co-operate with other countries to organize the international federation throughout the world.

The following officers were elected for 1921-1923:—President, Mrs. W. Todd, Orillia, Ont.; First Vice-President, Mrs. Arthur Murphy, Edmonton, Alta.; Second Vice-President, Mrs. David Watt, Birtle, Manitoba; Recording Secretary, Mrs. W. F. Cameron, Davidson, Sask.; Corresponding Secretary, Miss Helen Beardmore, Port Credit, Ont.; Publicity Secretary, Mrs. J. F. Price, Calgary, Alta.; Treasurer, Miss Elizabeth Campbell, Fredericton, N.B.

WOMEN'S INSTITUTES IN QUEBEC

The 8th Annual Convention of the Quebec Women's Institute was held at Macdonald College in June. Miss Roach, Superintendent, reported that fifty-five institutes, with a membership of over one thousand four hundred, were now in operation. Among the activities reported were the providing of schools with musical instruments, equipment for school lunches, drinking fountains, provisional for medical attendance, assistance to school fairs, the establishing and furnishing of community halls, and others.

Child Welfare Work is to receive special attention this year. By resolution it is decided to continue efforts to induce the Quebec government to allow women to sit on school boards; to ask for the continuation of the government grant of \$10 to each county and also an additional grant of \$2 for each local branch, to be used at the discretion of the county executive in extending the work of the institutes.

NOVA SCOTIA WOMEN'S INSTITUTES

The eighth annual convention of the Women's Institutes of Nova Scotia was held at the Agricultural College, Truro, on June 15 and 16. The report of Miss Helen J. Macdougall, Superintendent, stated that five demonstrators were employed during July and August of last year giving instruction in canning and food values. Most of the institutes were visited by demonstrators.

A short course for girls, occupying ten days, was held at the College. The instruction given included lessons in cookery, canning, food values, table setting and serving, dressmaking, and basketry. The students prepared and served their own meals.

A course of four lectures and demonstrations in home economics was given to adults in July and August, and again in January. The winter course instruction included, besides, cooking, nursing, gardening, and poultry keeping. Settlers' wives were also provided with a course in general household activities.

Ten new institutes were organized during the year, bringing the total up to seventy-two in the province.

The Committee on Agriculture reported sending out free to members of institutes instruction on gardening as well as one thousand packages of flower seeds and a quantity of roots of ornamental plants.

Plans were under way for the opening of correspondence courses in dressmaking, millinery, and cooking.

Resolutions were passed asking that the school curriculum and grading system be modified so as to give credit for technical knowledge and skill; recommending that greater attention be given in schools to patriotic exercises and other means of promoting love of country.

ALBERTA GIRLS' CLUBS HOLD CONVENTION

The Alberta Girls' Clubs affiliated with the Women's Institutes of the province, held a convention at the University, Edmonton, at the end of June. These clubs, numbering fifty-four, have a combined membership of about eight hundred young girls residing in rural districts. Addresses were given by Judge Emily Murphy, past president of the Federated Women's Institutes of Canada,

and Mrs. G. A. Gates, the girls' club director from the Women's Institutes. Community singing was engaged in at the various sessions. The programme was carried out almost entirely by the girls themselves.

Mrs. Gates impressed the convention with the great responsibility of the right training for girls entering into womanhood. She expressed the view that the clubs were doing much to develop individuality, and suggested various committees to keep the girls busy and interested. These committees were intended to develop the physical, the mental, and the social interests of each. She suggested the advantage of members using the meetings for developing their ability by reading aloud, reciting, conducting plays, and re-telling stories read by individuals. Games and physical culture were also recommended as an important part of the work of the clubs.

In a resolution passed the provincial government was asked to provide dormitories for girls at agricultural schools.

The presidential address referred to the value of the provincial club, and the importance of each club linking itself up with the other clubs.

The value of nature study was emphasized. This, perhaps, more than anything else, would incite a fuller appreciation of the beauties of nature, and in this way insure a favourable impression of rural life.

The following officers were elected:—President, Minnie Page, Elnora; first vice-president, Thelma Atkins, New Dayton; second vice-president, Clara Johnson, Alliance; secretary-treasurer, Olive Flemming, Alliance. The province is divided into four districts and for each a director was appointed.

THE QUEBEC SOCIETY FOR THE PROTECTION OF BIRDS

The Annual Report of the Province of Quebec Society for the Protection of Birds, 1920, contains a brief history of the work accomplished since the society was organized. The society has been especially active in arousing the interest of the children in bird protection. A large number of children have been enrolled in its membership, each signing a pledge card, and wearing the society's button.

Field days on Saturday afternoons during the spring and autumn months have been a feature of the work. Nesting boxes have been erected in parks and other suitable spots. School competitions were held for the making of bird houses, which were brought together for exhibition. Honorary game wardens were appointed by the society, and literature was distributed.

Following their appeal, the government of the province of Quebec established bird sanctuaries at Percé Rock, Bord Rock, in

the Magdalens, and portions of Bonaventure Island, off the Gaspé coast.

The junior membership of the society was reported to be 4,000, and the adult membership 250. The society is in affiliation with the National Association of Audubon Societies. Mrs. W. E. L. Dyer, Westmount, Que., is secretary.

THE ONTARIO DAIRY COUNCIL

The Ontario Dairy Council has issued a circular to the dairy farmers of the province soliciting their co-operation with a view to the proper development of the dairying industry. The circular points out that one of the chief needs is a better quality of raw material; the second is to increase the butter-fat content of the milk. To this latter end, dairymen are asked to encourage the establishing of cow-testing centres and the use of pure-bred sires. The Council promises to encourage and support exhibits of dairy products and carry on campaigns in co-operation with other organizations for the more general use of milk and dairy products. The circular outlines a plan for raising funds for the work of the council:—

(a) Cheese Factories, Creameries, Condensaries, Milk Powder Plants, and Milk Distributors for city and town trade will be asked to contribute—

One-third of a cent for every thousand pounds of milk received, or

One cent for every hundred pounds of butter-fat received.

The above contribution will be based on last year's business.

(b) The Dairy Farmers are asked to contribute—

One cent for each dollar received for milk or cream sold during the month of June. This payment will constitute the contributor a member of one of the dairy organizations of the province, and will be his total annual contribution for all purposes, including the National Dairy Council.

The circular points out the manner in which county organizations may co-operate in the activities of the council.

ONTARIO APPLE SHIPPERS' ASSOCIATION

The annual meeting of the Ontario Apple Shippers' Association was held at Presqu'île Point in July, and was attended by a large number of apple shippers, also by representatives of the various railway companies and ocean steamship lines. The election of officers resulted as follows: President, R. J. Graham, Belleville; Vice-President, W. J. Bragg, Bowmanville; Secretary, R. B. Scripture, Brighton.

UNITED FRUIT COMPANIES

The ninth annual meeting of the United Fruit Companies, Ltd., was held at Kent-

vill, N.S., in June, and was attended by over 200 delegates. The election of officers resulted as follows: President, F. W. Bishop; Vice-president, Ernest H. Johnson; Secretary, K. L. Pineo. A. E. McMahon was re-appointed general manager. The financial statement showed the best record ever made, the entire turnover amounting to \$3,292,549 at a cost of 1.1 per cent.

In reviewing the past season's operations, the president stated that the United Fruit Companies had been instrumental in chartering no less than 20 steamers for the carriage of fruit, potatoes and fertilizers.

ONTARIO HONEY CROP

The Ontario Beekeepers' Association has issued a final report of the white honey crop for 1921. The crop report committee of the association met in Toronto on July 21 and authorized the statement to be issued. Reports of the honey crop had been received from 442 members of the association, besides special reports from forty of the most prominent apiarists in different parts of the province. The reports showed that from 21,169 colonies, spring count, 1,591,278 pounds of honey had been produced. This is an average of about 75 pounds per colony. The quality is stated to be much better than it was last year, with the yield fairly well distributed over the province.

The committee recommended prices of 15 to 18 cents per pound for best quality, light extracted, wholesale, and 20 to 25 cents per pound to the consumer. For comb honey the price set was for No. 1, wholesale, \$2.50 to \$3.50 per dozen, and for No. 2 \$1.75 to \$2.50. The minimum price was recommended for barrels or whole crop, and the maximum price for part crop or honey in tins of 2½, 5, and 10 pounds.

THE WESTERN PLANT QUARANTINE BOARD

The Western Plant Quarantine Board, composed of representative quarantine officials from each of the Western United States, Mexico, Hawaiian Islands, and British Columbia, held their annual conference in Victoria, B.C., in the month of June. Many quarantine subjects were discussed. Those of greatest importance to Canada were sterilization of empty freight cars and other vehicles of transportation; rust and mite of the filbert, and white pine blister-rust. The prospective embargo on apples from fire blight districts in British Columbia and the United States was also discussed, and thorough consideration given to the question as to the possibility of apples from a blight-infested district carrying the bacteria to another country.

THE AGRICULTURAL GAZETTE OF CANADA

SOUTHERN SASKATCHEWAN CO-OPERATIVE STOCK YARDS, LIMITED

The second annual meeting of the Southern Saskatchewan Co-operative Stock Yards Limited, was held at Moose Jaw, in June. Less than 4,000 cars of live stock were reported to have been handled during the past year, as compared with 11,000 cars the previous year. This is accounted for by the shortage of feed and corresponding abnormal conditions. The abattoir at the stock yards was to be re-opened for business this coming autumn.

The following officers were elected:—President, J. H. Grayson, Moose Jaw; Vice-President, O. Olafsen, Mortlach; Secretary, A. W. MacPherson.

THE SASKATCHEWAN STOCK GROWERS' ASSOCIATION

The ninth annual convention of the Saskatchewan Stock Growers' Association was held at Maple Creek, Saskatchewan, late in June. The programme consisted of addresses on the state of the live stock industry by the Deputy Ministers of Agriculture for Saskatchewan and for Alberta, and the consideration and approval of a number of resolutions important to the live stock industry. These resolutions requested provincial and federal action to overcome the difficulties attending the marketing of live stock due to recent United States legislation; urging upon the Dominion government to purchase and control fence, corrals and dipping plant erected on the Matador Ranch, which will soon revert to the Crown; asking that rentals imposed on Forest and Indian Reserve pasture lands be reduced; urging elimination of scrub and grade males; approval of the Cattle Breeders' Association scheme of taxing all bulls in the province and of using the moneys thus secured to paying a bonus to owners of first-class sires.

The following officers were elected:—President, J. Byers, Valjean; Vice-President, O. Olafsen, Mortlach; Secretary, Hugh McKellar, Moose Jaw.

STOCK GROWERS' PROTECTIVE ASSOCIATION OF WESTERN CANADA

The annual convention of the Stock Growers' Protective Association of Western Canada was held in Calgary in the month of June. This organization has completed its amalgamation with the old Western Stock Growers' Association, with headquarters at Medicine Hat. The business of the meeting was largely to agitate for better conditions for cattle raisers in Western Canada. Among the important matters taken up were the renewal of grazing leases, the removal of the embargo against the admission of Canadian store cattle into Great Britain, the inspection of stock at feeding points and central markets, impounding, dipping regulations, and

cattle thieving. The following officers were elected: President, D. E. Riley, High River; 1st Vice-president, Geo. McElroy, Calgary; 2nd Vice-president, A. E. Cross, Calgary; secretary, W. F. Stephens, Calgary.

BRITISH COLUMBIA DAIRYMEN'S ASSOCIATION

The Dairymen's Association of British Columbia held a convention on June 6 at Vanderhoof, a northerly interior point in the province. Meetings were held at points passed during the journey of the delegation, which occupied six days. Addresses were given by the Minister of Agriculture and other officials of the department. A feature of the programme of the convention was a cattle judging competition for boys and girls. The prizes for the competition consisted of three pure-bred bull calves of the Ayrshire, Guernsey and Holstein breeds donated by representative breeders in the province. The winners were given the choice of the animals in the order of the proficiency of their judging. Cash prizes were also provided. The Secretary of the Association is Henry Rive, Dairy Commissioner, Department of Agriculture, Victoria.

WESTERN CANADA IRRIGATION ASSOCIATION

The fifteenth annual convention of the Western Canada Irrigation Association, held in Vernon, B.C., in July last, was attended by some two hundred delegates. The programme included the following speakers and subject:—Dr. John A. Widstoe, President of the University of Utah, "Excessive Irrigation and its Dangers," and "Some Odds and Ends in Irrigation Practice;" Professor F. A. Wyatt, of the University of Alberta, "The Action of Water on Soils;" W. F. Laieman, of Vernon, and A. Griffin, of Brooks, on "Irrigation District Problems;" R. H. Helmer, Superintendent of the Dominion Experimental Farm, Summerland, "Forage Crops under Irrigation;" Professor Barss, of the University of British Columbia, "Frost Protection in Orchans;" G. M. Stewart, of the Dominion Seed Branch, "Growing Alfalfa Seed for Market;" A. S. Dawson, Chief Engineer of the Canadian Pacific Railway's Irrigation Systems, "Wood Stave Pipe Construction;" L. G. Charlsworth, Chairman of the Alberta Irrigation Council, "Irrigation District Development in Alberta;" and A. C. R. Yuill "The Construction of Dams and Spillways;" a paper by Lionel Stevenson on "Overhead Irrigation as Practised on Vancouver Island" was read by W. J. Byker of Nelson, who added some interesting information with regards to the results obtained under this system near Creston, B. C. The officers elected for the ensuing year were: Honorary president, Sir James Lougheed, Minister of the Interior; President, Hon. J. A.

Maharg, Minister of Agriculture for Saskatchewan; Honorary Vice-presidents: Hon. E. D. Barrow, Hon. T. D. Pattullo; minister of public works for Alberta; minister of highways for Saskatchewan; G. R. Marnock, Lethbridge, W. H. Fairfield, superintendent Experimental Farm, Lethbridge; Vice-presidents: D. J. Wylie, Maple Creek, and Walter Hockvale, Medicine Hat; Secretary, James Colley, Calgary.

CANADIAN FLORISTS' AND GARDENERS' ASSOCIATION

The convention of the Canadian Florists' and Gardeners' Association, held at Peterborough, Ont., in August, elected the following officers: President, W. E. Groves, Hamilton; First Vice-president, C. J. Hay, Brockville; Second Vice-president, F. D. Clark, Toronto; Secretary-treasurer, H. J. Eddy, Montreal.

THE LIBRARY

LIST OF MAJOR PUBLICATIONS RECENTLY ADDED TO THE DEPARTMENTAL LIBRARY, INTERNATIONAL INSTITUTE BRANCH, DEPARTMENT OF AGRICULTURE, OTTAWA.

A Course of Practical Physiology for Agricultural Students, by J. Hammond, M.A., and E. T. Halnan, M.A., School of Agriculture, Cambridge University. Cambridge University Press, 1920.

History of Canadian Wealth, by Gustavus Myers. Chicago, C. H. Kerr & Co., 1914.

Les mouvements des végétaux; du réveil et du sommeil des plantes, par René Dutrochet. Paris, Gauthier-Villars et cie., 1921.

The Physiology of Protein Metabolism, by E. P. Cathcart, M.D., D.Sc., F.R.S. London, Longmans, Green & Co., 1921. ((Monographs on biochemistry.))

The Plant Alkaloids, by T. A. Henry, D.Sc. (Lond.), F.C.S., Superintendent of Laboratories, Imperial Institute. London, J. & A. Churchill, 1913.

Light and the Behaviour of Organisms, by S. O. Mast, Ph.D. New York, John Wiley & Sons, inc., 1911.

An Introduction to the Study of Landscape Design, by H. V. Hubbard, Assistant Professor of Landscape Architecture, and Theodora Kimball, Librarian, School of Landscape Architecture, Harvard University. New York, Macmillan Co., 1917.

The Microscopy of Vegetable Foods with Special Reference to the Detection of Adulteration and the Diagnosis of Mixtures, by A. L. Winton, Ph.D. 2nd ed. New York, John Wiley & Sons, Inc., 1916.

Diseases of Economic Plants, by F. L. Stevens, Ph.D., Professor of plant pathology, University of Illinois, and J. G. Hall, M.A., rev. ed. New York, Macmillan Co., 1921.

Practical Biological Chemistry, by Gabriel Bertrand and Pierre Thomas, Faculté des sciences, Institut Pasteur, tr. from the third ed. by Hector A. Colwell, M.B. (Lond.), D.P.H. (Oxford). London, G. Bell & Sons, Ltd., 1920.

Pathogenic Micro-organisms, a Practical Manual for Students, Physicians and Health Officers, by W. H. Park, M.D., and Anna Wessels Williams, M.D., 7th ed. Philadelphia, Lea & Febiger, 1920.

The Butter Industry, by O. F. Hunziker, s B.S.A., M.S.A. LaGrange, Ill., published by the author, 1920.

Agricultural Meteorology—The Effect of Weather on Crops, by J. Warren Smith, B.S.M.S. New York, Macmillan Co., 1920

Practical Botany, by F. Cavers, D.Sc., F.L.S., 2nd ed. London, University Tutorial Press, Ltd., 1920.

The Practical Book of Outdoor Rose Growing, by George C. Thomas, Jr. Garden edition. Philadelphia, J. B. Lippincott Co., 1920.

The Scientific Feeding of Animals, by Prof. Otto Kellner; authorized translation by William Goodwin, B.Sc., Ph.D., lecturer on agricultural chemistry, Southeastern Agricultural College, Wye, Kent. London, Duckworth & Co., 1915.

Fundamentals of Bacteriology, by C. B. Morrey, B.A., M.D., Professor of Bacteriology, Ohio State University. Phil., Lea & Febiger, 1921.

The Romance of the Microscope—An Interesting Description of its Uses in all Branches of Science, Industry, Agriculture, and in the Detection of Crime. by C. A. Ealand, M.A. Philadelphia, J. B. Lippincott Co.,

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Practical Meat and Food Inspection, by William Robertson, M.D. (Glas.), D.P.H., 2nd ed. London, Baillière, Tindall & Cox, 1920.

Handbook of Fungus Diseases of the Potato in Australia and their treatment, by D. McAlpine. Melbourne, Kemp, 1911.

Agricultural Writers from Sir Walter of Henley to Arthur Young, 1200-1800 . . by Donald McDonald. London, Horace Cox, 1908. 228 pp., ill. facsimiles.

Sheep . . by William Youatt. London, Robert Baldwin, 1837.

The World's Meat Future, by A. W. Pearse, F.R.G.S., 2nd ed. New York, E. P. Dutton & Co., 1920.

Précis d'extérieur du Cheval et des principaux mammifères domestiques; 2nd edition, par F. X. Lesbre, Directeur de l'Ecole nationale vétérinaire de Lyon. Paris, Asselin et Houzeau, 1920.

The Fur Trade of America, by Agnes Laut. Toronto, Macmillan Co. of Canada, 1921.

Condensed Description of the Manufacture of Beet Sugar, by Franz Murke, Ph.D., A.M. New York, John Wiley & Sons, Inc., 1921.

Flowers of Mountain and Plain, by Edith S. Clements, Ph.D., 2nd ed., New York, H. W. Wilson Co., 1920.

Vocational Chemistry for Students of Agriculture and Home Economics, by John J. Willaman, Ph.D. Philadelphia, J. B. Lippincott Co., 1921. (Farm life text series.)

Landscape Gardening, by Andrew Jackson Downing, 10th ed., revised by Frank A. Waugh. New York, John Wiley & Sons, Inc., 1921.

Modern Propagation of Tree Fruits by B. S. Brown, M.S., New York, John Wiley & Sons, Inc., 1916.

The Textile Fibres: their Physical, Microscopical and Chemical Properties, by J. Merritt Matthews, Ph.D., 3rd ed. New York, John Wiley & Sons, Inc., 1913.

A Text-book of Paper-Making, by C. F. Cross and E. J. Bevan; 5th ed. London, E. & F. Spon, Ltd., 1920.

British Poisonous Plants, by Charles Johnson. London, Taylor & Francis, 1856.

Forecasting the Crops from the Weather, by R. H. Hooker. (Reprint from Quarterly Journal of the Royal Meteorological Society, Vol. 47, April, 1921.)

Report on an Enquiry into a Uniform System and Standard of Meat Inspection in Scotland, by Lt.-Col. Gerald Leighton. Edinburgh, 1921.

Rothamsted Memoirs on Agricultural Science, Vol. IX. 1909-1916. Harpenden, Jeffery, 1919.

Agricultural History Society Papers. (Reprint from the Annual Report of the American Historical Association for 1918.

The Breeding and Feeding of Farm Stock, by James Wilson. London, Methuen & Co. Ltd., 1921.

Chemistry of Food and Nutrition, by Henry C. Sherman, Ph.D., 2nd ed. New York, Macmillan Co., 1920.

The Abolition of Money as the Basis of Human Peace and Equality, by Seijiro Kawashima, editor of the "Dai Nippon." Tokyo, 1920. 66 pp.

The Community Health Problem, by Athel C. Burnham, M.D., Toronto. Macmillan Co. of Canada, 1920.

Butterfly and Moth Collecting, by A. E. Hodge. London, C. Arthur Pearson, Ltd., 1919.

Trees in Winter, by A. F. Blakeslee and C. D. Jarvis. Toronto, Macmillan Co. of Canada, 1913.

The Science of Life: an Outline of the History of Biology and its Recent Advances, by J. Arthur Thomson, M.A. London, Blackie & Son, Ltd., 1920 (?)

The Story of a Great Agricultural Estate—Being the Story of the Origin and Administration of Woburn and Thorney, by the Duke of Bedford. 2nd ed. London, John Murray, 1897.

Vitamines—Essential Food Factors, by Benjamin Harrow, Ph.D. New York, E. P. Dutton & Co., 1921.

NEW PUBLICATIONS

DOMINION DEPARTMENT OF AGRICULTURE

Researches in Regard to Wheat, Flour and Bread. Bulletin No. 97, Experimental Farms Branch. By Chas. E. Saunders, B.A., the late Captain R. W. Nicholls, F.C.S., and P. Russel Cowan, B.S.A.

Swine Husbandry in Canada.—Bulletin No. 17 (Third Edition) of the Branch of the Live Stock Commissioner. By J. B. Spencer, B.S.A.

The Canadian Record of Performance for Pure-Bred Poultry—Section A—1919-20. Issued by the Poultry Division of the Live Stock Branch, contains Regulations, Standards, Farms and Records of Fowls qualified for certificates under Section "A."

Silo Construction.—Exhibition Circular No. 102 of the Experimental Farms.

White Burley Tobacco in Canada.—Bulletin No. 45 (Second Series). By H. A. Freeman, Tobacco Specialist, Central Experimental Farm.—This bulletin is a treatise on the growing and after treatment of White Burley Tobacco.

QUEBEC

Report of the Pomological and Fruit Growing Society of the Province of Quebec, 1920.—Published as a supplement to the report of the Minister of Agriculture. Contains report of the addresses at annual meeting and at summer meeting of the society.

NOVA SCOTIA

Proceedings of the Entomological Society of Nova Scotia for 1920, No. 6.—Issued by order of the Legislature of Nova Scotia.

MANITOBA

Report of the Department of Agriculture and Immigration, 1920.—Contains in summarized form a report of the work of each Branch of the Department for the year under review.

How to Preserve Eggs.—Circular No. 47 (Third Edition), by M. C. Herner, B.S.A., Professor of Poultry Husbandry, Manitoba Agricultural College.

The Western Wheat-Stem Saw-Fly.—Circular No. 57. By A. V. Mitchener, B.A., B.S.A., Lecturer in Entomology, Manitoba Agricultural College.

Chemistry of the Farm Water Supply.—Circular No. 58. By W. F. Geddes, B.S.A., Assistant Professor of Chemistry, Manitoba Agricultural College.

"*Poison Ivy*" is the title of a hanger printed in colours and issued from the Botany Department of the Manitoba Agricultural College.

SASKATCHEWAN

Wheat Marketing.—A report to the government of Saskatchewan, by James Stewart and F. W. Riddell, members of the Canadian Wheat Board. The report constitutes an outline of the present wheat marketing system and makes recommendation for its improvement.

Fourteenth Annual Report of the Secretary of Statistics.—Report on Saskatchewan's grain crops, live stock and grain marketing for the year ending April 30, 1921. Issued by the Department of Agriculture of that province.

BRITISH COLUMBIA

Locust Control.—Circular No. 63 of the Horticultural Branch of the Department of Agriculture.

Some Good Egg Recipes.—Circular No. 37 of the Live Stock Branch of the Department of Agriculture.

Climate of British Columbia.—Bulletin No. 27 of the Department of Agriculture. Contains tables of rainfall, snowfall, sunshine, and temperature for the year 1920.

Agricultural Statistics, 1920.—Bulletin No. 88 of the Department of Agriculture, Statistics Branch. This bulletin contains statistics of agricultural industries of the province. These statistics relate to the areas of lands under crop and under cultivation; products of the various crops; animals, animal products; and climate as affecting agriculture, determined by the means of the postal census taken in June through the joint efforts of the Dominion and Provincial Governments.

Starters for Farm Cheese-making.—By Wilfrid Sadler, Professor of Dairying, the University of British Columbia. Circular No. 1 of the Dairy Branch of the Department of Agriculture.

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Farm Cheese.—By N. S. Golding, Assistant Professor of Dairying, University of British Columbia. Circular No. 2 of the Dairy Branch of the Department of Agriculture.

Cottage Cheese.—By N. S. Golding, Assistant Professor of Dairying, University of British Columbia. Circular No. 3 of the Dairy Branch of the Department of Agriculture.

Clotted Cream.—By Wilfrid Sadler, Professor of Dairying, the University of British Columbia. Circular No. 4 of the Dairy Branch of the Department of Agriculture.

Fertilizers.—Bulletin No. 87 of the Department of Agriculture of British Columbia, issued from the Soil and Crop Division.

Goat Raising in British Columbia.—Bulletin No. 64, British Columbia Department of Agriculture, has reached its third edition in

the space of three years. A new edition places the number of goats in the province at about five thousand.

Agriculture in West Kootenay.—Circular No. 34. By W. J. Bonavia, Secretary, Department of Agriculture, Victoria, B.C.

The Calendar of the University of British Columbia, 1921-22.—Gives information regarding the course for students in agriculture.

MISCELLANEOUS

The Canadian Ayrshire Herd Book, Volume 30.—Contains pedigrees of animals numbering from 67021 to 74400. The volume also contains lists of the officers of the association to 1920; delegates to the Canadian National Ayrshire Breeders' convention, and illustrations of many prize winning animals and herds in 1920.

THE AGRICULTURAL PRESS

Agricultural Alberta, Edmonton, Alta.

July, 1921. *Use of Silage for Fattening Steers.* A. A. Dowell and G. F. Flack.
Cow Testing Work Carried to Success. A. H. White, Superintendent of Cow Testing.

The Canadian Countryman, Toronto, Ont.

August 6. *The Cost of Distributing Milk.* H. H. Dean, Professor of Dairy Husbandry, O.A.C., Guelph, Ont.

The Farmer's Advocate, London, Ont.

August 4. *The Relation of Freight Rates to the Steer Feeding Industry.* A. Leitch, Professor of Farm Economics and

Director of Farm Surveys, O.A.C., Guelph, Ont.

The Farmer's Magazine, Toronto, Ont.

July 7. *The U.S. Tariff and Dairy Products.* H. H. Dean, Professor of Dairy Husbandry, O.A.C., Guelph, Ont.

July 14. *Hints on the Storage and Culture of Fruits and Vegetables.* W. T. Macoun, Dominion Horticulturist, Dominion Experimental Farm, Ottawa.

The Nor' West Farmer, Winnipeg.

July 5. *Live Cattle and Chilled Meat Trade Compared.* H. S. Arkell, Canadian Livestock Commissioner.

PART V

The International Institute of Agriculture

FOREIGN AGRICULTURAL INTELLIGENCE

All communications in regard to this section should be addressed to T. K. Doherty, International Institute Commissioner, Department of Agriculture, West Block, Ottawa.

SCIENCE AND PRACTICE OF AGRICULTURE

GENERAL INFORMATION

284.—The Effect of Milling on the Digestibility of Graham Flour.—LANGWORTHY, C. F. and BEUEL, H. J., in *Proceedings of the National Academy of Sciences*, Vol. V, No. 11, pp. 414-517. Washington, Nov., 1919.

In the United States, the bulk of the wheat used for flour is made into flour which contains 72% of the wheat kernel, called "Patent flour;" part is made into flour containing 85%, called "entire flour" or "whole wheat flour;" part is also made into flour which contains 100% of the wheat kernel, known as "Graham flour." The flour containing 72% has a much higher digestibility than that of the flour containing from 85% to 100%, as the coefficients of digestibility in Table I show:—

methods of milling on the digestibility of Graham flour. A Minnesota spring wheat was milled in 5 different ways; the flour was made into bread (with small quantities of lard, molasses, salt, ginger and baking powder), and the resulting bread was eaten by men with fruit (oranges), butter, sugar coffee or tea, in food tests. For determining the results the usual analytical methods were employed. The results of the digestion tests are set forth in Table II, in which the flours obtained by the various methods of milling are classed in increasing degrees of fineness. They show that the digestibility of the protein increases with the degree of fineness, as might be expected, for it has been shown (U.S. Dept. Agric. Bull. 751, 1919) that the protein of bran is digested to the extent of 44% in the case of fine bran, and 28% in the case of coarse bran; on the other hand, the digestibility of the carbohydrates

TABLE I—Co-efficients of Digestibility of Flours of Various Percentages.

	Tests by other authors.		Tests by the authors	
	Number of tests	Coefficients of digestibility	Number of tests	Coefficients of digestibility
Flour containing 72%:—	31		43	
Protein.....		88.1		89.5
Carbohydrate.....		95.7		99.9
Flour containing 85%:—	23		16	
Protein.....		81.9		87.1
Carbohydrate.....		94.0		98.3
Flour containing 100%:—	24		33	
Protein.....		76.9		84.2
Carbohydrate.....		90.1		94.4

The method of milling affects the size of the particles and the extent to which the walls of the aleurone cells are broken or weakened (while kneading, the walls of these cells are broken at the weak places). The authors investigated the effect of the various

varied slightly. In Table II, the estimated digestibility of the protein and the carbohydrates represent the digestibility of these constituents in the flour alone, after allowance has been made for the undigested residues of the other foods in the ration.

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TABLE II—Fineness and Average Digestibility of Graham Flour milled by Different Methods.

Method of millings	Percentage of flour passing through 100 sieve	Digestibility of the flour					
		Digestibility of the entire ration				Estimated digestibility of protein	Estimated digestibility of carbo-hydrate
		Protein	Fat	Carbo-hydrate	Ash		
Laboratory roller mill.....	% 8.2	% 72.1	% 94.4	% 96.0	% 70.1	% 70.7	% 95.3
Commercial roller mill.....	22.8	72.1	95.6	95.4	67.6	70.4	93.8
Steel-burr mill.....	32.4	79.2	95.0	96.1	73.8	78.5	95.3
Attrition mill.....	36.6	75.5	92.9	96.1	69.7	74.5	95.4
Stone-burr mill.....	39.2	79.2	96.5	96.6	78.4	78.2	96.8

157.—The Nutritive Value of the Wheat Kernel and its Milling Products.—OSBORNE, T. B. and MENDEL, L. B., with the co-operation of FERRY, E. L. and WAKEMAN, A. J., in *The Journal of Biological Chemistry*, Vol. XXXVII, No. 4, pp. 557-601. Baltimore, April, 1919.

The authors undertook a detailed study of the composition and nutritive value of the wheat seed and its milling products, from the particular point of view of the problems arising from modern milling methods and the yield desired of the latter for general use. They review the literature on the composition of the embryo, the outer seed coats or bran, the endosperm and the whole seed, and they give the data extracted from this literature or obtained from their own investigations. The chief points are summarized in appended tables.

Applying the results to the question of the degree to which it is desirable to mill flour, the authors conclude that, except in special cases, little can be gained by including bran and embryo in the flour when this is used for human food under the conditions prevailing in the United States, where the greater part of the flour consumed is taken along with other foods which make good the nutritive deficiencies of its protein better than would be done by the proteins of embryo and of bran. Again, considering that the rations of farm animals require protein supplements and that wheat bran is a good source, the by-products of milling will be better utilized as food for animals than for man. Besides, as about 80% of the wheat kernel can be so improved in nutritive value by adding animal products to the diet that a much smaller amount of flour will satisfy the protein need of nutrition, it may well be that the use of the by-products of milling for the production of meat, milk, or eggs will result in a greater economy in the use of flour than if these were used directly for human food.

CROPS AND CULTIVATION

22.—The Influence of Cold in Stimulating the Growth of Plants.—COVILLE, F. V., in *Proceedings of the National Academy of Sciences*, Vol. 6, No. 7, pp. 434-435. Easton, Pa., July, 1920.

The author gives facts contradicting the generally accepted belief that in regions having a cold winter the native trees and shrubs become dormant because of the cold and that warm weather is of itself the sufficient cause of the beginning of new growth in the spring.

Dormant trees and shrubs which have had two or three months of chilling, either out of doors or in artificial storage, start into growth in the normal manner when spring comes, but, if the dormant plants have been kept warm all winter they do not start into growth at the usual time in spring but continue their dormant condition for weeks or months, sometimes for a whole year, and when finally they do begin to grow their growth is of an abnormal character. One of these long dormant plants can readily be started into healthy growth, however, even after the expiration of a year, by subjecting it to a period of chilling. The best temperature for chilling is 32° to 40° F. It may be applied in either light or darkness.

During the process of chilling the starch stored in the cells is transformed into sugar, and not until this has been done can the plant utilize its store of starch in making its spring growth. If warmth alone would start the plants into growth they would begin growing in Indian summer and the stored food that the plant requires for its normal vigorous growth in the following spring would be wasted in a burst of new autumn growth, which would be killed by the first heavy frosts, and would be followed by a winter of weakness and probable death.

Further investigations are necessary especially to determine the proper temperatures for the storage of different kinds of seeds, bulbs, cuttings, and grafting woods; proper temperatures for the treatment of plants which are to be forced from dormancy to growth at unusual seasons; and proper temperatures for the storage of nursery stock, so that the nurseryman may have plants in proper condition for shipment on any date he desires.

166.—The Influence of Pruning on the Resistance of Fruit Trees to Cold: Investigations in the United States.—WHITTEN, J. C., in *Monthly Weather Review*, Vol. XLVII, No. 8, p. 570. Washington, August, 1919.

The general condition of a plant at a given time, the degree of maturity or quiescence, the quickness of growth, have all a more or less marked influence on the plant's resistance to unfavourable surroundings.

Investigations made at the Missouri Agricultural Station have shown that sap concentration is least (minimum sugar content) during the periods of rapid growth in spring and at the beginning of summer.

The suspension or slowing of growth brings about an ever-increasing concentration of sap, with a rise in reserve stores. The earlier that growth stops in autumn, the greater will be the concentration of sap and the greater will be the quantity of reserve material.

On the other hand, as the degree of concentration increases, the freezing point becomes lower and thus the plant is able to stand lower temperatures than would be the case if the juices were weaker. For example, in a peach orchard, vigorous growth of branches continued up to the first autumn frosts. The following spring the blooms were killed in a single night by a fall of temperature to -2.78°C . In another orchard in the same district, growth stopped much earlier, while the leaves kept healthy and active until the first frosts.

The following spring the flowering buds were very resistant to frost.

Pruning.—With the old pruning methods, trees underwent every winter a very severe pruning which brought about a vigorous growth of shoots at the ends of the pruned branches. These shoots continued lengthening and producing leaves all summer, thus preventing the concentration of sap and the storage of reserve material.

With the new pruning system, on the other hand, the main branches are untouched; they are only cleared every year by the removal of useless side branches, so that growth stops early.

These branches and their leaves, of slow growth, have compact tissues, evaporate and transpire very little and thus keep their

sap concentrated. In addition, the leaves do not remove moisture from the fruit during dry seasons.

By this pruning system not only is resistance to low temperatures obtained, but also resistance to drought.

174.—A Review of the Literature on Tillage.—SEWELL, M. C., in *Journal of the American Society of Agronomy*, Vol. II, No. 7, pp. 269-309, bibliography of 70 publications. Lancaster, Pa., 1919.

The heaviest expense in producing cereal and annual forage crops is on account of tillage:—ploughing and cultivation. The depth and frequency of ploughing, the number of weedings have a material influence on the cost of production of a crop. The prevailing opinions on the subject are, however, so conflicting that a review of the literature relating to it is most opportune. After recalling to mind the forerunners (Tull, Priestley), then the classic agriculturists of the 19th century, and lastly modern authors, the author points out that the prevailing theories regarding deep and frequent ploughing are not founded on experimental data and he formulates the following conclusions:—

(1) Ploughing deeper than 7 inches does not generally cause an increased yield.

(2) Shallow ploughing may produce as great yields as deeper ploughing, but the depth less than 7 inches which is best for economic production has not been determined.

(3) There are not sufficient data to determine the expediency of frequent ploughing, but it appears that a suitable rotation of crops enables the number of ploughings to be decreased.

(4) Cultivation may be necessary only to extirpate weeds or to put the soil into condition for absorbing rainfall; it is therefore, practical, except in very heavy soils, to reduce the amount of cultivation where it is intended primarily to maintain a soil mulch.

(5) Many soils have naturally sufficient aeration, without cultivation, to insure optimum bacterial and chemical activity.

175.—Lime Requirements in the Soil Determined Chemically and Physiologically.—HARTWELL, B. L., PEMBER, F. R., and HOWARD, L. P., in *Soil Science*, Vol. VII, No. 4, pp. 279-282. Baltimore, 1919.

Experiments made with lettuce and beet (lime-loving plants) in pots containing a normal soil which had received a copious application of nitrogen, phosphoric acid and potash, plus varying amounts of slaked lime. Liming caused an increase in the yield, but after the maximum growth was reached, further liming did not further

increase growth, although the lime requirement of the soil was chemically still considerable. The addition of superphosphate to unlimed pots caused an increased growth in lettuce in spite of a markedly increased lime requirement in the soil as determined by chemical examination. This tends to show that the elimination of the effects of alumina in acid soils is of greater importance than the neutralization of the acidity.

177.—**The Action of Some Common Fertilizers and Manures.**—GREAVES, J. E., and CARTER, E. G., in *Soil Science*, Vol. VII, No. 2, pp. 121-160, bibliography of 165 publications. Baltimore, 1919.

After a full account of the works hitherto published in scientific literature on the various soil amendments and stimulants, the authors report some laboratory experiments on the action of various salts on the nitrogen and phosphorous of the soil in their various forms.

It stands confirmed that the sulphates of magnesium and calcium, the chlorides of sodium, potassium, magnesium and calcium, the nitrates of potassium, calcium and magnesium, also the salts of manganese and iron generally, can be efficient stimulants of soil fertility.

The stimulating action would be due, in certain cases, to an increase of available phosphorous in the soil, and in others to an increase in nitric nitrogen, increases caused by the action of the salts in question and sufficient to explain the additional yield corresponding to their application. A remarkable increase is that of nitric nitrogen, which, in the case of sulphate of calcium, may be as much as 97%. The increase of available phosphorous, either in the form of soluble phosphoric acid or in the form of organic phosphorous, was noted in all cases but two; namely, with nitrate of manganese and with carbonate of magnesium. The maximum increase in soluble phosphoric acid was caused with nitrate of magnesium (15.5%) the increase in organic phosphorus was greatest with carbonate of manganese (62.6%).

While sulphate of calcium is the strongest stimulant for rendering more nitrogen available, carbonate of manganese acts similarly for phosphorus in the combined increase of its two forms (soluble phosphoric acid and organic phosphorus).

181.—**The Agricultural Value of Organic Manures.**—RUSSELL, E. J., (Rothamsted Experimental Station), in *The Journal of the Board of Agriculture*, Vol. XXVI, No. 3, pp. 228-247. London, 1919.

Review of field experiments made in various places in England with different organic manures (rape cake, guano and

shoddy) compared with nitrate of soda, sulphate of ammonia and with farmyard manure, to determine experimentally whether the higher price paid for those organic manures was justified beyond the measure of their content of fertilizing elements (nitrogen, phosphoric acid and potash), in view of the fact that hitherto no well-defined field experiments had been made on the subject. From the experiments undertaken at Rothamsted (the most conclusive) with barley, wheat and mangolds, grown continuously on the same ground during 16 years, it appears that the nitrogen from rape cake in equal quantities is not so effective as that from nitrate of soda or sulphate of ammonia when they have been reasonably applied with sufficient quantities of phosphoric acid and potash. Further, rape cake has no residual effect on wheat or barley, while such effect is very marked, for at least two years, on mangolds; this is probably due to the very strong growth of their leaves which were ploughed into the soil each year.

Rotation experiments also showed that rape cake had little appreciable effect after the year of application.

Experiments on light soils at Woburn also did not show any superiority of rape cake over mixtures of nitrate of soda and other chemical manures.

Comparing, on a basis of equal amounts of nitrogen, the respective effects of Peruvian guano, rape cake and shoddy during the year of application, the values were in the ratio 100 : 91 : 88, with the difference that shoddy had a certain residual effect.

The preference, shown for rape cake and guano is only explained by the fact that they constitute compound manures (rape cake: nitrogen 4.75%, phosphoric acid 2%; Peruvian guano: nitrogen 6%, phosphoric acid 16%, potash 2%) capable of being applied without ill consequences even by inexperienced persons and in a single application, in large quantities (10 cwt. to 1 ton per acre in the case of rape cake), where chemical manures would have to be applied in several relatively small doses to avoid injury, especially to garden crops. Moreover, rape cake and guano are well adapted to the preparation of compound manures and facilitate their use with manure drills.

308.—**Relative Resistance of Various Crops to Alkali.** HARRIS, F. S. and PITTMAN, D. W., in *Bulletin No. 168, Utah Agricultural College Experiment Station*, pp. 1-23, 69 fig. Logan (Utah), July, 1919.

Different plants show considerable variation in their resistance to soil alkali. Some wild plants grow only where the salt content is high. On the other hand, most cultivated plants suffer continually in the presence of very large quantities of soluble salts; there

are a few exceptions to this rule, e.g., the date palm.

In many of the arid regions of the world the presence of alkali is one of the chief obstacles to the development of agriculture.

Between tracts completely free from alkali and those where the salt concentration is such as to prevent crops, there are very large zones of intermediate character where it is possible to introduce crops relatively less sensitive to the injurious action of alkali. The experiments described in the Bulletin under review were made with the object of studying the germination and growth of various crops in alkali soil; they dealt with numerous species of cultivated plants and several varieties of each species.

Crops tested:—14 varieties of oats, 8 varieties of wheat, 3 varieties of barley, rye, 7 varieties of maize, 3 varieties of millet, 5 varieties of sorghum, 8 types of forage legumes, 4 varieties of beans, 7 varieties of fodder grasses, 5 kinds of vegetables, sugar beet, buckwheat, hemp, flax, rape.

The different varieties of oats did not show any great difference in their resistance:—Boswell Winter, Red Rust Proof, Black and White Tartar, and Colorado No. 9 were slightly less resistant than the others. The lower concentrations of salts stimulated growth, and this stimulation continued up to 1,000 millionths for the chloride, 2,000 for the carbonate and 3,000 for the sulphate. Above these limits the number of plants obtained and their growth declined rapidly.

For wheat, similar conditions as for oats were observed. Turkey Red was the most resistant and Velvet Don the least resistant.

Among the varieties of barley tested, Black Hulless was the most resistant and Utah Winter the least.

Only one variety of rye was tested, and it showed itself very resistant.

The maize showed effects of toxicity at low concentrations, but was, however, resistant, and was able to grow considerably even at very high concentrations. In comparison with other crops, it seemed to be more sensitive to the action of sodium chloride than to that of the sulphate or carbonate. Millet showed similar resistance to maize.

Among the varieties of sorghum tested, Collier's showed itself most resistant, and Milo Maize the least so. *Vicia villosa* showed tolerance for chloride.

The growth of alfalfa ceased at a concentration slightly lower than that required for stopping the growth of *Melilotus alba*.

Of the grasses, the rye grasses were the most resistant though very sensitive; *Poa pratensis* was the least tolerant and is extremely sensitive; *Dactylis glomerata* was only slightly more resistant.

Rape was more resistant to chloride than to carbonate and sulphate; on the other

hand, sugar beets were stimulated by low concentrations of carbonate, but injured by chloride and still more by sulphate of sodium.

Kohl rabi was very resistant to sulphate at low concentrations, but was very sensitive to carbonate even of low concentration, and a concentration over 3,000 millionths stopped growth. Taken altogether, the data collected lead to the conclusion that the application of salts at concentrations higher than 4,000 millionths for chloride, 8,000 for carbonate and 12,000 for sulphate is injurious for ordinary crops. These figures would have to be modified if they were obtained from analysis of alkali soil, since the relation between alkaline chlorides and carbonates is not the same for "salts added" to the soil as for "salts extracted" from the soil.

In any case in land rich in salts the most suitable crops are cereals and the least suitable forage grasses. Of the forage crops may be recommended:—Vetches, *Melilotus alba*, alfalfa, and *Vigna Catjang*, but Timothy grass and Alsike clover are not advisable.

Borax Fertilizer Experiments.—BLAIR, A. W., in *New Jersey Agr.*, Vol. 2, No. 10, pp. 12-13, 1920.

Experiments conducted by the New Jersey Experiment Stations in co-operation with the U.S. Department of Agriculture on the influence of borax on the potato crop when mixed in different amounts with a standard fertilizer mixture are reported, showing that 30 lbs. of anhydrous borax per acre had only a slightly depressing effect on the yield even when applied in the row at the time of planting.

Fifty pounds of borax had only a slightly depressing effect when applied in the drill three weeks before planting. When applied in the drill at the time of planting there was definite injury and a decidedly depressed yield. Applications of 100 lbs. or over of borax per acre practically ruined the crop. Applying the fertilizer about three weeks before planting the potatoes reduced to a marked degree the toxic effect of the borax.

189.—The Composition of Cereal Grains: Mistakes Made in Locating the Chemical Constituents of Wheat and Rice Grains; Aleurone.—G. VARESCHI, I., in *Annali della R. Accademia di Agricoltura di Torino*, Vol. LXI, pp. 3-31. Turin, 1918.

The author examines critically several of the commonest treatises on botany, showing their mistakes regarding the location and nature of the chemical constituents of wheat and rice grains. He makes out that several authors confuse between aleurone (a mixture of albuminoids not yet well defined and separated) and gluten (a mixture of at least 5 albuminoids, among which glutenin and

gliadin, especially the latter, are typical), and he draws the following conclusions from his work:—

(1) True gluten is found only in wheat and rye grains.

(2) The albumen or kernel of wheat, rice and the other cereals contains not only starch but also always albuminoid material (gluten and non-gluten).

(3) The gluten, whether previously formed or not, exists with the starch in the albumen and not in the so-called "aleurone" layer, and in much more minute quantities in the outer coats. In wheat-seed albumen, starch does not exist alone, but is always associated with gluten. The quantity of gluten increases from the middle towards the outside of the albumen; it has not yet been proved whether the gluten pre-exists in the albumen or is formed by the action of water.

With the following reagent: 1 gm. Hofman violet + 50 gm. water + 6 to 8 gm. sodium bisulphite + 9 to 10 cc. hydrochloric acid at 1.19, it is easy to recognize the albuminoid materials in flour.

(4) It is easy to separate gluten from starch in wheat, but difficult to separate albuminoid from starch in rice.

Rice contains glutenin, glutencasein, glutenfibrin, edestin or phytovitellin, but not gliadin, which is typical of true gluten. On the other hand, rye, like wheat, contains gliadin, glutenin and conglutin (which appears to be identical with edestin); it therefore contains a true gluten.

(5) It is erroneous to state that aleurone is synonymous with gluten.

(6) The term "aleurone" should be abolished, so as not to cause confusion, and replaced by the generic name "albuminous or protein matter."

192.—New Types of Wheat, Rye and Oats Obtained by Hybridisation and Selection at Svalof, Sweden.—NILSSON, N. HJALMAR, in *Sveriges Utsädesförenings Tidskrift*, Year XXIV, No. 3, pp. 116-117. Malmö, 1919.

"203, Birgitta, 086" is a new kind of wheat obtained by crossing Smaahvede and Extra Squarehead II. From comparative cropping tests carried out in Ostergotland it was found to be superior to Sol II in grain yield; it is much more resistant to attacks of the rhynchote *Cicadula (Jassus) sexnotata*.

In earliness it shows itself equal to the Sol variety, and is a type of wheat especially suited to the fertile land in the Ostgota plain.

"204, 0955." This variety of wheat, the result of the cross Pansar × Fylgia, is destined to replace the Fylgia variety, to which it is plainly superior in its greater resistance to the rigours of winter and to rust and in the greater strength of its straw. It ripens earlier than the Pansar variety, and at the same time as Fylgia wheat.

"205, Stal, 0302," is a new variety of rye obtained as a pure line (by genealogical selection) from the Starn variety, from which it is distinguished by its rather shorter and more robust straw, but it remains equal to the original variety both in quality of grain and in yield.

"209, 01180, b" is a new variety of oats obtained from the cross Seger × Kron, destined to replace the Kron variety.

"210, 01171, b" is a new variety of oats from the cross Seger × Gul Naesgaard and is destined to replace the Seger variety.

Flax Growing Experiments in Ireland.—*Journal of the Department of Agriculture and Technical Instruction for Ireland*, Vol. 20, No. 3, pp. 351-361. Dublin, 1920.

Variety tests and breeding work with flax, conducted during the period 1915-1919, are reported. The results obtained in fertilizer tests from 1901 to 1915, inclusive, are presented, and may be summarized as follows:—

Applications of potassium salts gave profitable increases, kainit and potassium chloride proving better than the sulphate. These salts gave similar results whether applied in winter or at the time of seeding. Where used in conjunction with 0.5 cwt. of ammonium sulphate, dressings at the rate of 1.5 cwt. of potassium chloride proved more profitable than 1 cwt.

Phosphatic fertilizers, alone, with potassium, or as part of a complete mixture encouraged weed growth at the expense of the flax, and their use was almost invariably attended by a loss, and very frequently even with smaller yields of scutched flax. The use of agricultural salt was not remunerative. The varied results obtained from the use of slow-acting nitrogenous fertilizers, such as rape meal, when in a mixture with kainit, did not recommend their uses in preference to either kainit or potassium chloride alone. The use of ammonium sulphate alone proved less profitable than when combined with potassium chloride, or potassium chloride alone. Lime applied to the preceding crop of oats following sod gave increased yields of flax. Applications containing soluble potassium fertilizers were the only kinds that prevented the flax sprouts from yellowing.

404.—Action of Heat on Sugar-Beet Seed.—SAILLARD, in the *Comptes rendus des Seances de l'Academie d'Agriculture de France*, Vol. VI, No. 5, pp. 91-92. Paris, February 4, 1920.

M. Tisserand has communicated to the Academy a note by M. Saillard (Director of the Laboratory of the Syndicate of Sugar Manufacturers) on the experiments he carried out with M. Vehrung as his co-worker on the action of heat on sugar-beet seeds.

The work was done with seeds of very good, good, and medium quality, which were heated in a thermo-regulated oven, while the germination tests were made on damp sand kept at 25°C.

The seeds of each quality were respectively heated for an hour to 40°, 50°, 60°, 70°, 80°, 90°, 100°, and 105° C., then germinated at 25° C. for 22 days together with unheated control seeds.

The following conclusions were arrived at:

(1) The seed clusters of the very good seeds with a 98% germination, and good commercial seed with an 87% germination, retain all their germination power when heated to 60°-70° C. as demonstrated by M. Schribaux.

(2) Bad seeds with a 36% germination, when submitted to the same temperatures, are mostly killed.

(3) A temperature of 80° C., even when maintained for 1 hour, does not alter the germination coefficients after 14 days with superior quality and good, ordinary quality seeds. It only retarded germination slightly.

These experiments will be of interest to those taking part in the competition opened by the French Ministry of Agriculture for the construction of a drying apparatus for beet seed that will enable them to be kept a long time, while leaving their germinating power unimpaired.

412.—**Degeneration in the Sugar-Beet and Its Remedy in Selection.**—CASSEL, L., in the *Bulletin de l'Association des Chimistes de Sucrierie et de Distillerie*, Vol. XXXVII, No. 4, pp. 131-140. Paris, October, 1919.

The flowering of the sugar-beet in its first year of growth is equally harmful to the grower, whose crop is reduced, and to the manufacturer as his root cutters wear out more rapidly. This anticipation of the flowering period has been explained by reference to heredity, but this is improbable because the sugar-beet is the product of long and careful selection, during which any suspected plants are rejected.

Commercial seeds come from parents and ancestors that have been rigorously controlled for a relatively long period (8 or 10 years). If heredity is excluded, then the problem of atavism comes in, seeing that cultivated selected plants tend, when the modifying action ceases, to return to the primitive type. In a wild state, beet is an annual plant, and it is only by means of prolonged selection that it has been possible to obtain the cultivated type which, during the first year, can store up the reserves which will enable it to grow and produce seed during the second year.

The tendency of the beet to "bolt" during the first year is, therefore, probably a sign of

reversion to the primitive type and a symptom of degeneration in the selected type.

In considering the causes that favour this process of degeneration, the author suggests that a plant submitted during its early growth to contrary conditions of soil and climate, which diminish its vitality, has a marked tendency to premature flowering. The author illustrates his theory by a number of examples taken from flower and fruit growing.

It is known that beets sown early give a higher percentage of "bolters" than beets sown later (normally). In the second case, the temperature is very high at sowing time, with the results that germination takes place rapidly and is complete in 10 to 12 days. Under these conditions the young plants are healthy and strong, remaining so up to an advanced stage of growth and accumulating large amounts of reserve material without flowering. On the contrary, if they are sown very early, they usually have to face cold and damp weather, germination is delayed, the early growth is weak and slow, and the plant, on the return of favourable growing conditions, tends to close its vegetative cycle prematurely as if, influenced by previous adversity, it feared to meet some new obstacle opposing the final act of reproduction of the species. Having gone so far, it now becomes a question either of abandoning early sowing or of submitting to the losses caused by bolting.

Besides the advantage consisting in the better distribution of the work, early sowing also leads to a greater production of sugar. Plants produced by early sowing, if not too injured by cold during their early growth, have attained, by the season of "second" heat, a development that enables them better to resist drought. In fact, the well developed roots penetrate to depths where the soil has most moisture and provide the plant with sufficient water to compensate for transpiration. If "bolting" can be avoided, the weight of roots and the sugar content will be greater.

The following measures are recommended in order to avoid the bad consequences (bolting) of early sowing:—

(1) Decortication of the seed, to facilitate germination.

(2) Shallow sowing, to aid emergence.

(3) Keep the soil loose for the young plants to emerge, without, however, breaking the surface layer up too much, as fine soil easily cakes under rain and thus prevents the young plants from coming up.

(4) Avoid premature thinning that would expose the isolated and still tender plants to a return of cold weather.

(5) The best method certainly consists in selection and crossing, carried out in such a

way as to produce new types that resist cold and consequently capable of growing even under unfavourable conditions of temperature.

212.—A Possible Method for Retarding the Flowering of Fruit Trees.—DIENERT, F., in *Revue de Viticulture*, Year XXVI, Vol. LI, No. 1328, pp. 379-380. Paris, Dec. 11, 1919.

For a long time fruit growers have tried to get fruit at a time of the year different from the normal crop season. Fruit grown under glass in mid-summer fetches a very high price. By forcing crops in order to obtain these late fruits, however, a rest must be given to replace artificially the natural winter rest; this is done by means of anaesthetics or cold.

For certain fruits, it would be of advantage to obtain late crops; thus, for example, cherries sell much dearer in August than in June. If these could be got in September or at the beginning of October, their sale would be still more profitable (in any case, cherry trees need only a temperature of 47°F. for flowering).

In April, 1919, the author chanced on an experiment that showed how to obtain cherries late in the year. Following on the use of chlorine, the growth of a cherry tree in the open was affected by the vapour and stopped. In September one part of the tree flowered and in October another part. The September flowers yielded fruit about the end of October.

This chance experiment shows that by the proper use of an asphyxiating gas the growth of a tree placed in the open can be arrested and fruit can be had later than the normal season. In this direction there is a field for further investigation.

213.—Methods for Heightening the Colouring of Fruit.—TRUELLE, A., in *La vie agricole et rurale*, Year IX, No. 35, pp. 123-125. Paris, August 16, 1919.

Colour counts for a great deal in the market value of fruit, which has to satisfy the consumer not only in taste but also in appearance.

It is admitted that the red colour develops by preference in sunlight and when there are frequent alternations of warmth in the daytime and cooling off at night, as is generally the case in autumn. Morning dew also, according to Bechtle, has a favourable effect in this respect.

On the basis of these observations, the author advises two operations:—removal of leaves and watering.

Leaves should not be removed all at once or too quickly. They must be taken off one by one and on several different occasions, not by tearing them off, but by cutting

through the middle of the stalk, so as to spare the eyes at the base. They must be removed only in the evening or in dull weather, when transpiration is greatly reduced.

With the peach, which has a very sensitive epidermis, the process must be very gradual e.g., uncovering the fruit in three operations.

With the finest apple, in particular those of the "Api" variety, gardeners grow them in individual bags which they gradually tear off at ripening time. They even turn the apple on its stalk so as to expose several sides to the sun.

Leaf removal is practised also with "chasselas" grapes in order to get the golden colour.

Watering consists in spraying with a syringe in the September evenings, when the day has been warm, and aiming preferably at the side exposed to the sun, so as to bring about enlargement and colouring. M. Opoix, Chief Gardener at the Luxemburg Gardens in Paris, advises the use of water containing a handful of salt to every 10 litres of water.

LIVE STOCK AND BREEDING

219.—Typhoid Fever and Infectious Anaemia of the Horse.—BASSET, J., in *Comptes rendus de la Société de Biologie*. Vol. LXXXII, No. 31, pp. 1262-1263. Paris, December 6, 1919.

In previous papers (1) the author has shown:—(1) that typhoid fever in the horse is inoculable, being caused by a filtrable virus; (2) that the virus is present in the blood, where it remains *in vitro* for over 15 weeks, and in *in vivo* for about 5 months; (3) that a first attack of the disease confers complete and immediate resistance *experimentally* for at least four months, and *clinically* for 18 months; (4) that at the beginning the fever is present alone for 2 or 3 days, and that, consequently, in times of epidemic the thermometer serves to diagnose the start of the disease and ensures for the patients the best chances of recovery.

As doctors and experimenters have been struck by the close similarity in the symptoms shown by horses affected with typhoid fever and those suffering from the acute form of anaemia, the author tried to find out if it were a case of distinct morbid entities and to compare them. Experiments on the subject show that:

(1) The two diseases are absolutely distinct; (2) they are very different, because, contrary to typhoid fever, infectious anaemia is essentially chronic; in the case of anaemia, as in the chronic forms of many diseases due to microbes (tuberculosis, farcy, malaria, etc.) the equilibrium of the organism is at the mercy of a more or less mild, common, or specific cause.

The author proposes to base on these experimental results a method for diagnosing

anaemia. Diseases due to parasites visible in the blood having been eliminated, the diagnosis will be based on the remittance or intermittence of the fever. In the absence of spontaneous feverish attacks, these will be brought on by injection into the blood of serum from any horse. It is not at all necessary to bring about several attacks of fever; a single one brought on, appearing about 24 hours after the disturbing infection, will assure the diagnosis.

(1) *Comptes rendus de l'Académie des Sciences*, August 21, 1911; *Recueil de méd. vétér.*, September 15, 1911, February 15, 1912; *Bul. Soc. cent. méd. vétér.*, March 12, 1912. (AUTHOR'S NOTE).

438.—Vaccination of Cattle Against Anaplasmosis.—LIGNIERES, J., in the *Bulletin de la Société de Pathologie Exotique*, Vol. XXII, No. 10, pp. 765-774. Paris, December 10, 1919.

By choosing the least virulent *Anaplasma argentinum*, or those from cattle that have long recovered, and passing them successively and at long intervals through the sheep and goat, such a fixity is attained in the attenuation of the parasite that they can be used almost without danger even for immunizing cattle against natural anaplasmosis.

The author now uses this new method on all the breeding cattle in the Argentine that are to be sent into regions where anaplasmosis exists.

348.—Genetic Studies in Poultry: Inheritance of Leg-Feathering.—PUNNETT, R.C. and BAILEY, P. G., in *Journal of Genetics*, Vol. VII, No. 3, pp. 203-213. Cambridge, May, 1918.

Results of experimental crosses between a breed with feathered legs (Langshan) and breeds with naked legs (Brown Leghorn and Gold-pencilled Hamburg).

Generally the F^2 fowls had slightly feathered legs; but there was considerable variation and one of the hens from a cross with the Hamburg breed had naked legs, and although crossed with a cock with naked legs, she produced progeny with feathered legs.

The F^2 generation of the cross with the Leghorn breed comprised 323 chickens with feathered legs and 106 with naked legs; the F^2 generation of the cross with the Hamburg breed comprised 117 chickens with feathered legs and 31 with naked legs; there was, therefore, a close approach to the ratio 3 : 1.

Fowls of the F^2 generation were, as far as could be judged, identified as homozygous for the character "leg-feathered." A few F^2 fowls were even heavier leg-feathered than the Langshan breed. Chickens with moderately feathered legs crossed with

chickens having naked legs very often produced chickens with heavily feathered legs; in these cases a greater number of cocks were feathered in this way than hens. The author relies on the hypothesis of modifying factors to explain these facts.

On the basis of the data recorded by Davenport the writer suggests that the character "leg-feathered" in Cochin-China and Dark Brahma breeds depends on 2 factors.

239.—Bee-Keeping and Honey Production in the United States.—JONES, S. A., in *U.S. Department of Agriculture, Bulletin* No. 685, pp. 61. Washington, June 20, 1918.

Statement and discussion of numerous statistical data relating to bee-keeping and honey production in the United States. A series of tables gives for each State: the number of hives on farms, the percentage of total swarming in the various months, wintering (food and protection against cold), losses from disease and during wintering (causes and percentages), annual production of honey per colony, the total annual honey production, the form of honey produced, the colour of the honey, the disposal of the honey taken (domestic use or for market), the value of the export of American honey from 1911 to 1917, the import of honey into the United States from 1911 to 1917, the principal plants furnishing nectar and pollen with average dates of the beginning and end of flowering periods, the plants furnishing nectar and pollen for surplus honey (as distinct from that which the bees consume). In conclusion the geographical distribution of the more important honeys is given.

FARM MACHINERY

Experience of Eastern Farmers With Motor Trucks.—TOLLEY, H. R. and CHURCH, L. M., in *U.S. Dept. of Agr. Bulletin* 910, pp. 37. Washington, D.C., 1920.

The results of a questionnaire indicating the experience of 753 farmers with motor trucks in the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, and Maryland, are reported.

The farms on which the trucks were used are of all sizes and types. The motor trucks varied in size from 1-2 to 5 tons, nearly half of them being 1-ton trucks, the preferred size. Only 18 per cent of the farms are less than 5 miles from the market, while nearly 25 per cent are 20 miles or more from the market.

The report indicates that the principal advantage of a motor truck is the saving of over half the time required by horses and

wagons in hauling. The principal obstacles to its effective use are bad roads. A majority of the truck users still use horses for some road hauling and in most cases for hauling in fields and around buildings. About one-fourth of those reporting do custom hauling, receiving an average of \$174 per year for this work.

Three-fourths of the trucks reported on operated on all or part dirt roads. Wind, snow, etc., were found to prevent the use of trucks on an average of about eight weeks per year. It is estimated that each truck travels an average distance of 3,820 miles per year and is used 173 days per year. Depreciation is the largest item of expense. Pneumatic tires are preferred for trucks of less than 1 ton and solid tires for those over 1 ton.

The average cost of operation of the $\frac{1}{2}$ ton trucks was about 8 cts. per mile, of the $\frac{3}{4}$ ton about 13 cts., of the 1-ton about 12 cts., of the $1\frac{1}{2}$ and $1\frac{3}{4}$ ton about 19 cts., and of the 2-ton trucks about 20 cts. The average cost of hauling crops, including the value of the driver's time at 50 cts. an hour, was about 50 cts. per ton-mile with the $\frac{1}{2}$ ton trucks, 34 cts. with the $\frac{3}{4}$ ton, 26 cts. with the 1-ton, 24 cts. with the $1\frac{1}{2}$ and $1\frac{3}{4}$ ton, and 18 cts. with the 2-ton trucks.

About half of the farms had decreased the number of work stock by at least one head since acquiring a truck. Less than 1 farm in 10 had disposed of more than two head. Over half of the farms of more than 120 crop-acres also had a tractor. This only slightly decreased the number of work stock.

RURAL ECONOMICS

Agricultural Accounting Offices in Sweden.—

H. JUHLIN-DANNFELT, in *International Review of the Science and Practice of Agriculture*, Year XI; No. 4, pp. 407-410. Rome, April, 1920.

Since the beginning of 1890, great efforts have been made to speed-up the development of small farms in Sweden, and, in this connection, attempts have been made to encourage the small farmers to keep accounts regularly, especially by giving premiums to those that do this. The money required has been furnished by the "Riksdag" which, since 1910, has voted an annual appropriation of \$3,750. This sum is distributed to societies for rural economics, or to accounting unions for use in this way, especially to subsidize accounting bureaux to help farmers to keep their books.

With the aid of this State subsidy, seven societies for rural economics and two accounting unions have established agricultural accounting offices. Of these, only the

accounting office of the province of Mal-mohus has attained any wide activity, whilst, in the majority of the other provinces, the offices have not become important.

In 1916, the General Agricultural Society of Sweden, which had just been founded, established an "exploitation bureau," with the objects of aiding farmers to keep accounts, to draw conclusions from them that would be of assistance in managing the farm, and to give advice on questions of rural economics.

By leaving the scientific elaboration of the accounting material from the accounting bureaux to the director of the "exploitation bureau" of the agricultural society, continuity in all that sphere of activity has been obtained.

The provincial accounting offices are made use of mainly by the small farmers; generally speaking, only 25% of those making use of the offices have been farmers owning more than 175 acres, as this is the largest area for which the State subsidy towards accounting expenses can be claimed.

The proportion of proprietors and tenants among those using the offices is not known, but it would probably be the same as that found among the farmers in the country, about 16% of whom are tenants. On the other hand, the "exploitation bureau" of the agricultural society is made use of largely by farmers owning larger areas.

The income of these offices consists chiefly of subsidies from the State and from the agricultural society on which the office depends, together with small sums paid by members of the society or payments for accounts accredited by the office.

The State subsidy reaches a maximum equal to the sum allowed by the agricultural society and may not exceed \$3.75 per account. In addition, it can only be paid during the first four years in which the farmer has recourse to the bureau for help. The upkeep of the "exploitation bureau" of the agricultural society is assured solely by the contributions of farmers who come to it for assistance.

Most of the offices have no other expenses save the salaries paid to the persons who administer them, and the salaries usually consist of a small fixed sum plus contributions from the clients.

Two main types of accounting are in use:—

Type A: Simple book-keeping.—This is intended to give a general view of the economic condition of the farm. The gross return, the cost of working, and the net yield of all the farming economy are calculated; the income and expenses are distributed among the various branches of the farm, the commercial movement between these branches is ascertained and, if required, the cost of labour is appropriately distri-

¹See "Bulletin of Foreign Agricultural Intelligence," March, 1913, p. 23.

buted, so that all the figures and information that can serve as a basis for the economic calculations necessary to guide the farmer can easily be obtained. In this type of account, no special calculations are made of the special profit and loss appertaining to the different branches of the farm.

Special accounts are opened for:—

- (1) the farm;
- (2) the exploitation of the forests (eventually);
- (3) the household;
- (4) private consumption;
- (5) provisions (eventually); and
- (6) other sources of revenue (eventually).

The accounts will be kept by the system of double entry.

Type B: Extended book-keeping.—This consists of the detailed calculations of the profit and loss (special accounts) appertaining to the different branches of farming economy, such as milk production, rearing young stock, pig breeding and, eventually, the different crops. The calculations are sufficiently detailed to show the production costs of the products sold and the transformation value of the products consumed on the farm. This type of book-keeping requires more detailed preliminary data than the former.

The lists and accounts that usually require to be made up are as follows:—

- (1) Inventory of the assets and liabilities at the beginning and end, respectively, of the financial year;
- (2) cash account; this also shows the state of credit;
- (3) accounts for the products and livestock.
- (4) day-book showing the hours worked by the men;
- (5) inventory of dead-stock;
- (6) account showing the distribution of labour to the appropriate accounts; and
- (7) household expenses account.

Among these, the first three numbers are always essential, whilst the need for the others depends on the size of the farm, and the extent to which it is desired that the accounts should be kept. In a simpler form of book-keeping, however, the account for products and livestock can be replaced by a household account.

If, in addition to farming, some industry of greater or lesser extent is carried on, such as a saw-mill, flour mill, distillery, starch factory, etc., accounts should be added dealing with these special branches of the farm.

During 1918, special studies, based on abstracts of the accounts, were made on 15 properties only. The greatest difficulty met with was the lack of interest shown by the farmers for accounts carefully and suitably kept. The large farmers prefer to keep their accounts themselves, and according to the method with which they

are already familiar. The small farmers as a rule keep no accounts at all.

The reports given, do not, therefore, disclose the individual situation of the farmers, and the different farms are indicated by numbers and all the figures are recalculated with hectares as a basis.

356.—**Farm Management Problems in the United States.**—BILLINGS, G. A., in *Journal of Farm Economics*, Vol. I, No. 1, pp. 3-7. Lancaster, Pa., June, 1919.

The unusual demand for food products and the scarcity of farm labour since the war began, have given rise in the United States to conditions which demand greater concentration of effort on farm management problems. These problems affect the community, the state, and the country as a whole and are in a measure sociological, but since they bear a close relation to production and to the individual farm, the basic unit of production, they are of vital importance to the economic management of the farm.

There has been no period in the history of the United States when economic conditions have changed so rapidly, requiring the most careful thought concerning the organization of farms of different types to meet present day needs, and the changes which may take place after the war; the policy of price fixing of farm products and its bearing on profitable production as compared with the fundamental law of supply and demand the mobilization of farm labour to produce the supply of food needed; and many other important factors have combined to furnish entirely new problems.

The cost of producing milk in large dairy regions and the cost of producing wheat as the basis of fixing the minimum price of wheat to the farmers, illustrates the kind of information which has more recently been demanded. The request for such information shows conclusively that the results from the investigation of farm management problems by state and federal departments should be tabulated, summarized and held in readiness for such requests. Moreover, this information should be put into such shape that opportunities may be given to the farmer to obtain suggestions for adjusting his system of farming to meet these changing conditions.

During the last ten years farmers have adjusted their business to meet slight changes in economic conditions. The ratio between food production and the increase in population has been quite constant.

The work in farm management has been therefore mainly to study the organization of farms and the farm practice in agricultural regions, in order to discover the relationships between farm enterprises and to

determine what factors have a direct bearing on net incomes. The influence of such studies should be to induce the farmer, whose farm is not producing profitably, to adopt those practices which will increase his income. This work has had a tendency to raise the average production and take care of the increase in population.

Increasing the Nation's Food Supply. The situation in relation to the food supply has been not so much economic as nutritional, that is, it has been a question of systems of production to feed the people rather than systems arranged purely for the sake of gain. No more effective work can be continued than the presentation of facts calling attention to the relative value of foods produced on an acre, with suggestions in farm practice that will increase profitably, if possible, those products of greater nutritional value.

Relation of the Labour Supply to Food Production. In view of the depletion of the country's food supply and the possibility of a continued demand for increased crop production, farm management men should devote special attention to methods of adjusting the farm plan to give maximum production with the greatest efficiency in the use of labour and machinery. The scarcity of skilled labour has been the principal limiting factor in production, and this factor will check the intensity of farming. The use of tractors in ploughing and the preparation of soil for sowing may enable the farmer to get his crops planted at the proper time, though possibly this may not be much of a factor in reducing costs. A saving of man power will likewise result from using four, six or more horses with larger machinery. Any line of work that will demonstrate how production may be maintained with less manual labour is most important at this time, otherwise there is great danger of land which might be used for wheat or other food crops being seeded down and a more extensive type of farming adopted.

It is essential to have information concerning the amount of labour required for farm operations and its distribution. These data are fundamental in working out cropping systems, particularly in determining when and how much labour is required for each month in the season. It will show in advance what regular labour is necessary, and indicate when extra help is needed. If it is impossible to obtain extra help at these times, it may be possible to introduce some labour-saving machinery or the farmer may co-operate with neighbours in exchange for help. If this difficulty is anticipated and the amount of labour required for different operations is known, the difficulty may be obviated by readjusting the crop

acres and the introduction of supplementary crops, which will maintain a more uniform labour requirement. It is in the solution of problems such as these that farm management men can be most helpful.

The economy in conducting farm operations is also influenced by the location of farm buildings and the shape and arrangement of the fields. The arrangement of farm areas, making larger and more uniformly-sized fields which can be more easily handled in rotation, would simplify the handling of machinery, save much time, and reduce the cost of production. Such work would attract the attention of farmers and be appreciated by them.

Standards Needed in finding Cost of Production.—The importance of adopting, as far as possible, standards in methods and agreements as to the elements in production cost studies, has been demonstrated by the greatly increased interest in this subject due to price fixing. Many agencies have been at work on these studies during the past year and such results as have come to light vary greatly in method of presentation as well as the elements included in determining cost.

Sometimes, overhead or indirect costs are included, and at other times omitted, in spite of the fact that every farm must bear in labour cost alone a burden of indirect expense equal sometimes to one-third of the cost of all the labour performed. These same discrepancies exist as to other elements such as machine cost, supervision, building costs, etc.

Sometimes particular interests affecting the point of view, influence the interpretation of inter-relationships in production cost finding. One group insists that all feedable crops produced and fed should be charged to live stock at cost of production. On the other hand, many writers, including those of the experiment stations and the United States Department of Agriculture, believe that market value at the farm is the only safe practical and correct value to use. The subject of cost production presents greater difficulties in certain aspects than almost any other branch of accounting, because of the many interrelations between farm enterprises. For example, certain equipment is used in preparing the ground, cultivation and sometimes harvesting of more than one crop. When land is prepared for oats or wheat, the land is also prepared for clover and timothy which follows. Likewise, in some regions, clover and timothy is seeded at the last cultivation of maize. Maize, oats and wheat are sometimes combined with live stock production. The raising of pure-bred cattle and milk production are very closely related and the costs would be hard to separate were it not

for an established rule among farm accountants that in pure-bred stock production milk is a by-product and the cost of feed in animal production is not chargeable to milk.

Importance of Studying Farm Practice.—Crop yields and production per animal are important factors in profitable farming. therefore any practice that will increase crop yields and production per animal will be not only of economic interest, but will increase the food supply. Experiment station results clearly point out methods for increasing production, but these conclusions may be confined to certain types of soil. Just as important results have been worked out by farmers under much more widely varying conditions; hence, the study of farm practice should be an important field of work.

Farm management surveys may help to analyse economic problems, but the story of how soils have been made productive through systems of rotation with clover, alfalfa, soya beans or other legumes, and the methods practiced in the use of cover crops, manure, lime and fertilisers, will help to interpret the figures obtained from surveys. Farm management surveys provide a basis for the analysis of systems of farm organization and the results from certain operations. Farm practice studies, on the other hand, will show the methods employed and why certain results are obtained. It gives additional information necessary to work out a complete farm plan. There is an unlimited field for work of this sort which will go far towards developing standards for farm operations.

Co-operative Investigations.—Progress in the study of economic problems will develop more rapidly, and the results of investigations will be applied more successfully by the most earnest co-operation between the United States Department of Agriculture and state agricultural institutions; between the investigator or demonstrator and the farmer.

The state institution is restricted in territory, whilst the federal department can study regions which may include several states.

There is a great amount of data which have been obtained through surveys, and which would make an interesting field of study if these data could be assembled and correlated. Instead of dealing with a few hundred or less, there might be several thousand records, which, when assorted, would give much larger groups and a basis for more accurate conclusions. It would give an opportunity for the study of selected types of farming, the profitability of different combinations of enterprises, and of many other problems hitherto impossible.

AGRICULTURAL INDUSTRIES

464.—*Transport of Milk in Frozen Blocks.*—*Le Froid*, Vol. VII, No. 12, p. 322. Paris, December, 1919.

The best method for transporting milk for long distances is as follows:—Freeze $\frac{1}{2}$ of the volume of the milk in blocks weighing from 10 to 25 kg.; place one of these blocks in each milk can, then fill with pasteurized milk cooled at 4°C. Milk treated in this way can be kept safely for 2 or 3 weeks and be transported to any distance.

It should not be forgotten, however, that while cold reduces the growing power of microbes, it does not completely destroy their faculty of secreting specific enzymes, and thus, from the hygienic point of view, cold can only be counted upon for preserving sound milk.

PLANT DISEASES

469.—*Dry Treatment With Copper Carbonate for the Prevention of Wheat Smut.*—DARNELL-SMITH, G. P., and ROSS, H., in *The Agricultural Gazette of New South Wales*, Vol. XXX, Part 10, pp. 685-692, 7 Figs. Sydney, 1919.

Years ago, laboratory and field experiments have led the authors to the conclusion that the copper sulphate solution in which wheat seeds are immersed in order to prevent smut from appearing is clearly injurious, not only to grains that are split or otherwise damaged, but also to healthy seeds, by retarding and, in certain cases even, preventing germination.

After the seed had been treated with the copper sulphate solution, the advice used to be given to immerse it again in lime water made from freshly burnt lime, so as to neutralise the acidity of the copper sulphate. As regards this, the authors think that, apart from the corrosive action of the copper sulphate, simply immersing the wheat in water is more or less harmful to the future plant. For example, if a bushel of wheat is immersed in water for 3 minutes, it requires 8-12 hours to dry. During this period, partial germination takes place and, if the grain is not sown at once in damp ground so that germination may continue, the swollen grains are stopped germinating and, when a second germination takes place some weeks later, when the conditions are again favourable, growth cannot be as healthy and vigorous as if the grains had not begun to germinate once before.

With the object of eliminating the use of water, and of finding a less harmful fungicide than copper sulphate, the authors have carried out many experiments of recent years and have been led to prefer copper carbonate to all the different dusting powders or gases that have been tried. Copper car-

bonate, besides being a perfect fungicide, is innocuous to the seed and has the advantage that it can be used in the dry state.

The method finally adopted for treating wheat seeds consists in powdering the seed with dry copper carbonate in the proportion of 2 per 1000. It was found to be essential to cover the seed completely with the copper carbonate powder, which can be better done by using a machine that mixes the wheat and copper carbonate together intimately than by doing it by hand.

The results of cultural tests made in 1917 and 1918 at the Wagga and Cowra Experimental Farms (New South Wales) showed an actual, marked increase in the yield per acre in the cases where the new copper carbonate treatment substituted the old method using a bath of copper sulphate. This increase is positive and, in certain cases, amounts to 100%.

The advantages derived from the use of copper carbonate instead of copper sulphate can be summarised as follows:—

- (1) No water is used.
- (2) There is no injurious action on either seed or young plant such as occurs with copper sulphate.
- (3) Seed wheat can even be treated several weeks before sowing.
- (4) No harm comes to the seed if it remains on a dry soil for several weeks without germinating.
- (5) Better germination is obtained.
- (6) This method is quicker and less laborious than using copper sulphate solution.
- (7) A better product is obtained.
- (8) The total quantity of seed grain required for sowing can be treated when the farmer can best spare the time and not necessarily a day or two before sowing.

INJURIOUS INSECTS

374.—Comparative Action of Chloropicrin on the Injurious Beetles *Calandra Oryzae* and *Tribolium Navale* (= *T. Ferrugineum*)
BERTRAND, G., BROCCQ-ROUSSEU and DASSONVILLE, in *Comptes rendus hebdomadaires des seances de l'Academie des Sciences*, 2nd Half-year, 1919, Vol. CLXIX, No. 26, p. 1428-1430. Paris, 1919 (i).

Tribolium navale F. (= *T. ferrugineum* F.), which lives in the caryopses of damaged cereals, in bran, old flour, etc., has been observed by the authors, but only in smaller numbers, in maize, more strongly attacked by *Calandra oryzae*. According to a preliminary experiment it appeared to the authors that *T. navale* is unable to attack healthy caryopses, and that it is only able to live on those which are already perforated by *C. oryzae*. It causes less extensive

damage than that caused by the other beetle, but nevertheless its destruction is necessary especially in certain determined cases.

It may be supposed that the treatment of caryopses with chloropicrin, in the circumstances previously indicated by the authors, would destroy, at the same time, *C. oryzae* and the other parasites which eventually accompany it. But the authors have shown that, restricting themselves to the limits in strength and time which assure the death of *C. oryzae*, the *Tribolium* beetles resist; and the separation of the two parasites is, so to speak, quantitative.

Does *T. navale* protect itself better than *C. oryzae* in the interior of caryopses? Is it less sensitive to the action of the toxic vapour? In order to prove this the authors measured, in a series of parallel experiments, the comparative action of chloropicrin on *T. navale* and *C. oryzae* proceeding as in their previous experiments.

The results obtained were as shown in a table, the insects being collected in groups of 10, the capacity of the flask being 8 litres, and the temperature between + 14° and + 19° C.

These results show clearly that the cause of the separation of the species of insects in the treatment of the infested caryopses is explicable by their unequal resistance to chloropicrin.

The comparative measures have been completed by the following experiments:—

(a) In 2 8-litre flasks were placed 6 litres of maize containing *C. oryzae* and *T. Navale*; in the first flask was placed a dose of chloropicrin corresponding to 25 gm. per cubic metre, and into the second a dose corresponding to 30 gm; after 24 hours all the *C. oryzae* beetles were dead and about 50% of the *T. navale* beetles remained alive.

(b) The conditions were the same as those in the preceding experiment but the time was longer; after 24 hours only the *C. oryzae* beetles were dead; after 60 hours all the *T. navale* beetles were also dead.

(c) As in *a* and *b* but increasing the quantity of chloropicrin; with 38 gm. per cubic m. after 48 hours there were still some *T. navale* beetles alive; with a dose of 40 gm. and after the same time all the insects were dead.

From a practical standpoint it is easy, on a basis of the quantitative results obtained, to determine the necessary conditions for the simultaneous destruction of the two species of beetles. The authors have succeeded, in the case of maize, in treating caryopses enclosed in sacks, exactly as they have described in the case of *C. oryzae*, but allowing the chloropicrin to act for at least 24 hours.

(1) See also *Agricultural Gazette* July–August, 1921, p. 497.

THE INTERNATIONAL REVIEW OF AGRICULTURAL ECONOMICS

The following is a brief indication of the contents of the more important articles in the March, 1921, number of the Institute Economic Bulletin. Persons interested in any of the articles may obtain the original Bulletin on application to the Institute Branch, Department of Agriculture, so long as the supply for distribution is not exhausted.

The Official and Voluntary Organization of Agriculture in Belgium.—13 pages. A short account of the movement in favour of rural organization in Belgium is given, then the official organization of agriculture in that country is discussed. The article deals with agricultural clubs, farm-women's clubs, beekeepers' societies, live stock breeding societies, societies or syndicates for the purchase of seeds, fertilizers, cattle feeds, etc., co-operative dairies, agricultural credit societies, Raiffeisen banks, central agricultural credit banks and Schultze-Delitsch banks.

The Sleeping Accommodation of Agricultural Labourers in France.—9 pages.

Some of the shorter articles are: The Co-operative Agricultural Movement in Czecho-Slovakia; The Swiss Union of Raiffeisen Credit Banks in 1919; Live Stock Insurance in Bohemia; The Provident Land Clubs in Spain; Mortgage Credit in Holland in 1919; Mortgage Credit in Switzerland in 1919; Wages and Distribution of Foreign Agricultural Labour in France; Agricultural Wages in Sweden in 1919; Alienation and Division into Lots of Uncultivated Lands Belonging to the State and Administrative Bodies in Portugal; Agricultural Colonization of the Pampa in Argentina; The Agrarian Reforms in Esthonia; The Cultivation of Uncultivated Lands in Mexico Declared to be a Work of Public Utility; The System of Purchase and Distribution of Grain and Flour in Spain.

AGRICULTURAL STATISTICS

THE CEREAL CROPS OF 1921.

REVIEW OF THE SUPPLY AND DEMAND SITUATION.

AREA OF CEREAL CROPS

Table 1

WHEAT

Countries	1921	1920	Average 1915-19
	acres	acres	acres
Belgium.....	305,000	306,000	287,000
Bulgaria.....	2,367,000	2,131,000	2,327,000
Spain.....	10,357,000	10,255,000	10,227,000
Finland.....	20,000	19,000	18,000
France.....	12,855,000	12,097,000	11,744,000
Alsace-Lorraine.....	310,000	288,000	226,000
England and Wales.....	1,978,000	1,875,000	2,156,000
Scotland.....	57,000	54,000	52,000
Greece.....	988,000	1,399,000	1,024,000
Hungary.....	2,606,000	2,082,000	.....
Italy.....	11,491,000	11,290,000	11,224,000
Luxemburg.....	27,000	27,000	25,000
Norway.....	41,000	41,000	26,000
Poland.....	1,569,000	1,791,000	.....
Roumania.....	4,642,000	5,156,000	.....
Czecho-Slovakia.....	1,428,000	1,567,000	.....
Canada.....	18,736,000	18,232,000	16,343,000
United States.....	56,744,000	57,192,000	57,873,000
India.....	25,127,000	29,864,000	30,916,000
Algeria.....	2,782,000	2,648,000	3,179,000
Morocco.....	1,462,000	1,997,000	1,551,000
Tunis.....	1,334,000	1,343,000	1,459,000
	157,226,000	161,654,000	150,657,000a

a Less Hungary, Poland, Roumania and Czecho-Slovakia.

THE AGRICULTURAL GAZETTE OF CANADA

Table 2

RYE

Countries	1921	1920	Average 1915-19
	acres	acres	acres
Belgium.....	523,000	523,000	400,000
Bulgaria.....	455,000	452,000	467,000
Spain.....	1,772,000	1,799,000	1,819,000
Finland.....	605,000	603,000	589,000
France.....	2,054,000	2,001,000	1,989,000
Alsace-Lorraine.....	110,000	108,000	88,000
Greece.....	222,000	131,000	62,000
Hungary.....	1,291,000	1,248,000	.....
Italy.....	297,000	282,000	280,000
Luxembourg.....	20,000	20,000	20,000
Norway.....	36,000	36,000	45,000
Poland.....	6,872,000	7,236,000	.....
Roumania.....	500,000	681,000	.....
Czecho-Slovakia.....	2,209,000	2,230,000	.....
Canada.....	728,000	650,000	358,000
United States.....	4,544,000	5,043,000	4,831,000
	22,238,000	23,043,000	10,949,000 ^a

^a Less Hungary, Poland, Roumania and Czecho-Slovakia.

Table 3

BARLEY

Countries	1921	1920	Average 1915-19
	acres	acres	acres
Belgium.....	91,000	90,000	78,000
Bulgaria.....	482,000	545,000	564,000
Spain.....	4,227,000	4,319,000	4,029,000
Finland.....	297,000	293,000	285,000
France.....	1,527,000	1,449,000	1,514,000
Alsace-Lorraine.....	121,000	118,000	98,000
Scotland.....	192,000	204,000	161,000
Hungary.....	1,173,000	1,201,000	.....
Italy.....	544,000	494,000	526,000
Luxembourg.....	5,000	5,000	6,000
Norway.....	156,000	156,000	125,000
Poland.....	2,298,000	1,944,000	.....
Canada.....	2,539,000	2,552,000	2,343,000
United States.....	7,713,000	8,083,000	8,155,000
Morocco.....	1,955,000	2,341,000	2,034,000
Tunis.....	988,000	934,000	1,209,000
Algeria.....	2,520,000	2,444,000	2,870,000
	26,828,000	27,172,000	23,997,000 ^a

^a Less Hungary and Poland.

Table 4

OATS

Countries	1921	1920	Average 1915-19
	acres	acres	acres
Bulgaria.....	302,000	332,000	342,000
Spain.....	1,553,000	1,588,000	1,460,000
Finland.....	1,038,000	1,013,000	980,000
France.....	8,073,000	8,166,000	7,385,000
Alsace-Lorraine.....	255,000	252,000	210,000
Scotland.....	1,049,000	1,032,000	1,074,000
Hungary.....	798,000	800,000	.....
Italy.....	1,186,000	1,159,000	1,152,000
Luxembourg.....	62,000	62,000	61,000
Norway.....	342,000	342,000	329,000
Poland.....	4,380,000	4,119,000	.....
Canada.....	15,396,000	15,850,000	13,122,000
United States.....	44,829,000	43,323,000	42,452,000
Algeria.....	554,000	574,000	575,000
Tunis.....	148,000	149,000	153,000
	79,965,000	78,761,000	69,295,000 ^a

^a Less Hungary and Poland.

THE AGRICULTURAL GAZETTE OF CANADA

PRODUCTION OF CEREALS

Table 5

WHEAT

Countries.	1921	1920	Prewar average 1909-13
<i>Europe—</i>	Bushels	Bushels	Bushels
Germany.....	100,000,000 ^a	82,859,000	113,100,000 ^b
Austria.....	6,900,000 ^a	5,494,000	5,422,000 ^b
Belgium.....	7,668,000	10,275,000	14,894,000
Bulgaria.....	41,741,000	41,190,000	29,308,000 ^b
Denmark.....	7,000,000 ^a	6,945,000	5,344,000
Spain.....	143,205,000	138,606,000	130,447,000
Jugo-Slavia.....	78,000,000 ^a	64,712,000	.....
Finland.....	276,000	272,000	251,000
France.....	282,000,000 ^a	230,406,000	317,639,000
Alsace-Lorraine.....	8,271,000	5,907,000	3,763,000
Great Britain and Ireland.....	57,000,000 ^a	56,898,000	59,640,000
Greece.....	11,170,000	12,194,000	9,400,000 ^b
Hungary.....	41,900,000	38,295,000	.....
Italy.....	188,128,000	141,338,000	183,336,000
Luxemburg.....	500,000 ^a	449,000	615,000
Norway.....	500,000 ^a	1,035,000	306,000
Netherlands.....	7,000,000 ^a	6,677,000	4,896,000
Poland.....	23,000,000 ^a	18,258,000	.....
Portugal.....	7,000,000 ^a	7,140,000	7,440,000
Rumania (former kingdom).....	46,000,000 ^a	24,000,000	57,896,000 ^b
Sweden.....	7,000,000 ^a	10,528,000	8,103,000
Switzerland.....	3,600,000 ^a	3,586,000	3,314,000
Czecho-Slovakia.....	30,000,000 ^a	26,167,000	23,541,000 ^b
Total Europe.....	1,097,859,000	933,231,000	978,655,000 ^c
<i>North America—</i>			
Canada.....	288,493,000	263,189,000	197,118,000
United States.....	756,825,000	787,128,000	686,697,000
Total North America.....	1,045,318,000	1,050,317,000	883,815,000
<i>Asia—</i>			
India.....	246,250,000	376,766,000	359,035,000
Japan.....	28,370,000	28,288,000	24,166,000
Total Asia.....	274,620,000	405,054,000	383,201,000
<i>Africa—</i>			
Algeria.....	33,150,000	8,561,000	34,998,000
Egypt.....	32,000,000 ^a	31,711,000	34,121,000
Morocco.....	20,040,000	22,000,000	18,202,000 ^b
Tunis.....	11,758,000	5,225,000	6,230,000
South Africa.....	8,000,000 ^a	8,113,000	6,520,000
Total Africa.....	104,948,000	75,610,000	100,071,000
<i>South America—</i>			
Argentina.....	175,000,000 ^a	184,930,000	148,908,000
Chili.....	27,000,000 ^a	27,161,000	14,000,000
Uruguay.....	10,000,000 ^a	10,321,000	6,519,000
Total South America.....	212,000,000	222,412,000	169,427,000
<i>Australasia—</i>			
Australia.....	110,000,000 ^a	146,795,000	90,500,000
New Zealand.....	6,000,000 ^a	5,974,000	7,070,000
Total Australasia.....	116,000,000	152,769,000	97,570,000
Grand Total.....	2,850,745,000	2,839,393,000	2,612,739,000 ^c

^a Estimates based on condition and acreage.

^b Average 1915-19.

^c Less Jugo-Slavia, Hungary and Poland.

THE AGRICULTURAL GAZETTE OF CANADA

Table 6

RYE

Countries	1921	1920	Average 1915-19
	Bushels	Bushels	Bushels
Belgium.....	19,172,000	18,169,000	7,315,000
Bulgaria.....	7,566,000	9,798,000	5,856,000
Spain.....	27,768,000	27,830,000	26,566,000
Finland.....	11,265,000	9,173,000	9,835,000
Alsace-Lorraine.....	2,968,000	2,258,000	1,530,000
Greece.....	3,151,000	1,360,000	929,000
Italy.....	5,118,000	4,539,000	4,794,000
Hungary.....	18,924,000	20,564,000	.....
Canada.....	11,707,000	11,306,000	5,586,000
United States.....	64,332,000	69,318,000	69,159,000
Total.....	171,971,000	174,315,000	131,570,000a

a Less Hungary.

Table 7

BARLEY

Countries	1921	1920	Average 1915-19
	Bushels	Bushels	Bushels
Belgium.....	4,419,000	4,350,000	3,449,000
Bulgaria.....	12,685,000	13,926,000	10,266,000
Spain.....	92,189,000	90,463,000	83,978,000
Finland.....	4,047,000	4,983,000	4,747,000
Alsace-Lorraine.....	3,900,000	3,300,000	2,550,000
Greece.....	6,430,000	7,026,000	6,025,000
Italy.....	11,023,000	5,870,000	9,319,000
Canada.....	58,027,000	63,311,000	57,104,000
United States.....	170,511,000	202,204,000	208,098,000
Japan.....	89,301,000	92,140,000	95,543,000
Algeria.....	52,406,000	9,425,000	38,163,000
Morocco.....	26,022,000	39,645,000	30,993,000
Tunis.....	13,550,000	2,622,000	8,377,000
Total.....	544,510,000	539,265,000	558,612,000

Table 8

OATS

Countries	1921	1920	Average 1915-19
	Bushels	Bushels	Bushels
Bulgaria.....	10,412,000	9,529,000	6,236,000
Spain.....	32,687,000	35,550,000	31,165,000
Finland.....	19,538,000	23,116,000	23,734,000
Alsace-Lorraine.....	9,350,000	8,202,000	5,921,000
Greece.....	3,891,000	3,761,000	3,406,000
Italy.....	35,663,000	22,798,000	32,274,000
Canada.....	457,544,000	530,710,000	419,775,000
United States.....	1,137,202,000	1,526,055,000	1,432,697,000
Algeria.....	17,583,000	4,669,000	14,639,000
Tunis.....	4,215,000	1,394,000	3,437,000
Total.....	1,728,085,000	2,165,784,000	1,973,284,000

According to estimates in Table No. 5 the world's production of wheat this season will be practically the same as that of last year. There is an increase of only 10 million bushels shown in the grand totals. It is, on the other hand, omitting Hungary, Poland and Jugo-Slavia, for which no estimates of the pre-war average are available, 96,000,000 bushels larger than the average pre-war production. The European pro-

duction exceeds that of last year by 164 million bushels, and is very nearly equal to that of the pre-war period. However, we must warn the readers of the "Gazette" against drawing any hard and fast conclusions from these estimates because so many of them are not official and are merely based on acreage and condition reports, although, on the whole, they agree pretty closely with the estimates of Mr. George

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Broomhall and those of the U.S. Bureau of Crop Estimates. The information, such as it is, is the best obtainable at this date and may be of practical interest to many.

Tables Nos. 6 and 7 for rye and barley, referring to only a few countries that have so far made official reports, exhibit a production very nearly equal to that of last

year. On the other hand, oats shows the big reduction of 437 million bushels. The United States and Canada together a reduction of 462 million bushels, while Europe shows an increase which is striking in the case of Algeria, Tunis and Italy. In fact, the same remark applies to these three countries' production of all the cereals.

MONTHLY EXPORTS OF WHEAT AND FLOUR, 1920-21

(Flour reduced to equivalent quantities of wheat)

Months	Canada	United States	India	Australia	Argentina	Total five countries
	Bushels	Bushels	Bushels	Bushels	Bushels	Bushels
1920						
August.....	6,065,000	32,550,000	22,000	2,257,000	6,420,000	47,314,000
September.....	5,321,000	34,994,000	29,000	2,612,000	3,144,000	46,100,000
October.....	19,114,000	43,033,000	31,000	2,948,000	871,000	65,997,000
November.....	29,483,000	30,989,000	340,000	1,515,000	223,000	62,550,000
December.....	37,468,000	30,179,000	1,334,000	1,650,000	79,000	70,710,000
1921						
January.....	14,612,000	27,105,000	3,309,000	8,834,000	1,713,000	55,573,000
February.....	11,983,000	23,075,000	1,961,000	10,968,000	6,627,000	54,614,000
March.....	11,179,000	20,763,000	2,046,000	10,738,000	7,790,000	52,516,000
April.....	7,392,000	24,801,000	684,000	14,432,000	12,900,000	60,209,000
May.....	10,442,000	31,624,000				
June.....	8,412,000	32,192,000				
July.....	5,743,000	30,413,000				
Total for grain year 1920-21.....	167,214,000	361,718,000 ^b	11,656,000 ^a	84,366,000 ^a	64,510,000 ^a	689,464,000
Manchuria.....						24,000,000
						713,464,000 ^b

^a Details for last 3 months not available.

^b It should be remembered that the United States imported some 54,000,000 bushels of wheat from Canada during the grain year. The total net exports of North America and of the world are therefore really smaller by 54,000,000 bushels than as given above.

WHEAT—DEMAND SITUATION

Countries	Crops 1921	Probable imports
	Bushels	Bushels
Great Britain and Ireland.....	57,000,000	210,000,000
France.....	282,000,000	50,000,000
Italy.....	188,000,000	55,000,000
Portugal.....	7,000,000	4,000,000
Greece.....	11,000,000	10,000,000
Belgium.....	8,000,000	40,000,000
Netherlands, Switzerland, Norway, Sweden and Denmark.....	25,000,000	30,000,000
Egypt, Mesopotamia, Constantinople and Turkey.....		15,000,000
Germany.....	100,000,000	50,000,000
Austria, Poland and Czecho-Slovakia.....	30,000,000	20,000,000
Russia.....		40,000,000
Total Europe and Mediterranean.....		524,000,000
Ex Europe.....		70,000,000
WORLD'S AGGREGATE REQUIREMENTS.....		594,000,000

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WHEAT—SUPPLY SITUATION

Countries	Carry-over Aug. 1st, 1921	Production, 1921	Home Needs	Probable Export	Carry-over Aug. 1st, 1922-
	Bushels	Bushels	Bushels	Bushels	Bushels
Canada.....	10,000,000	288,000,000	98,000,000	185,000,000	15,000,000
United States.....	60,000,000	757,000,000	600,000,000	180,000,000	37,000,000
Argentina.....	66,000,000	175,000,000	80,000,000	110,000,000	51,000,000
Australia.....	42,000,000	110,000,000	45,000,000	80,000,000	27,000,000
Algeria.....		33,000,000		3,000,000	
Roumania.....		46,000,000		16,000,000	
Bulgaria.....		42,000,000		5,000,000	
Manchuria.....				12,000,000	
Total.....				591,000,000	

Prospective Imports.—The prospective demands of Europe, apart from Russia, are reduced in consequence of the considerably increased production of the European crops this year. Estimates of this increase vary between 120 and 160 million bushels. Table No. 5 shows an increase of 164 million bushels. Where official estimates of production are not yet available our estimate is based in part on increased acreage and especially on the excellent conditions reported from the great majority of the countries. The basis of our estimate was in most cases the official acreage multiplied by the actual per acre yield of the preceding year increased by three bushels per acre. This possibly in some cases will show excessive results as compared with the official figures which, are as yet wanting for a large number of countries. It is to be observed that Mr. Broomhall estimates the requirements of Europe, including those of Russia, at 536 million bushels. Granting Russia 40 million bushels of imports, which is perhaps more than the Allies under present conditions will be able to distribute there, our estimate of European requirements is 523 million bushels. However, Mr. Broomhall's estimate of only 56 million bushels for the rest of the world appears too low. The actual total net exports for the past year (ending August 1st 1921), in part unofficial, are given by other estimators at 658 million bushels. Not more than 560 million bushels of this can have gone to Europe, leaving 98 millions for the rest of the world. Hence, we believe our estimate of 70 million bushels for ex-European requirements in the current year is not excessive, for recent reports indicate that the crops of China and Manchuria are faring badly and the Manchurian wheat exports, of which we have reduced the estimate from 24 million bushels last year to 12 millions for this year, are not unlikely to go exclusively to China instead of to ex-Asiatic countries as was the case last year. In our calculations Jugo-Slavia and Hungary are removed from the import column as the improved appearance of their crops justify the expectation that they

will produce enough for their own needs and perhaps spare small quantities for contiguous countries.

An examination of the two tables representing demand and supply shows that the totals almost balance. This indicates a shortage of supply to satisfy the demand. As a matter of fact, within any given year the actual official exports have exceeded the recorded official imports by as much as 20 million bushels.

The European demand will be largely influenced by two other factors, viz.: the outturn of the rye crop and the coarser grains and potatoes. Very few official data are yet available from which to form a reliable estimate of the production of rye. Ten scattered countries that have so far reported have produced about the same quantity as last year. The Scandinavian countries that have suffered considerably from the drought this year will probably import a larger quantity of rye than usual. On the other hand, barley, oats and potatoes have been exceptionally affected by the drought: the German potato crop in particular is known to have suffered very severely. The coarser cereals and potatoes have in recent years been mixed with the flours of other cereals for bread-making, hence the possibility of increased demand for wheat and rye.

Prospective Exports.—In the above table the export of only 180 million bushels is granted to the United States as against 200 million bushels estimated by others, including Mr. George Broomhall. It is evident that in order to spare that quantity for export the United States would have to reduce their consumption to a point below normal. We allow only 600 million bushels, which may be compared with an estimate made by the International Institute earlier in the year of 612 million bushels for the past grain year. The quantities in the table granted to the Southern Hemisphere are large compared with the shipments that have been actually made in other years between the first of January and the first of August when our

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grain year ends. There are only seven months for shipment of the new crop within our grain year. When the crops are large considerable quantities necessarily must be carried over to the following grain year so as to be distributed over the twelve months as is the case in the Northern Hemisphere. For none of the European countries do the above figures in the consumption column

include more than the needs for human food and seed, whereas, it is recognized that as a rule a considerable quantity of a country's wheat crop is not merchantable or even useful for such purposes and is in consequence fed to animals. Large stocks of grain held from an old crop, as has been seen in Australia, are frequently seriously affected by fungus and insect enemies.

LIVE STOCK STATISTICS

FRANCE

Classification	December 31, 1920	December 31, 1919	Increase (+) or decrease (-)	
			in number	per cent
Horses.....	2,542,820	2,413,190	+129,630	+ 5.4
Mules.....	178,470	167,180	+ 11,290	+ 6.8
Asses.....	297,540	303,100	- 5,560	- 1.8
Cattle.....	12,782,100	12,373,660	+408,450	+ 3.3
Sheep.....	9,372,360	8,990,990	+381,370	+ 4.2
Swine.....	4,583,470	4,080,560	+502,910	+12.3
Goats.....	1,228,580	1,174,860	+ 53,720	+ 4.6

BESSARABIA

Horses.....	421,307	402,679	+ 18,628	+ 4.6
Cattle.....	791,082	655,011	+136,071	+20.8
Sheep.....	2,031,752	1,593,925	+437,827	+27.5
Goats.....	14,885	15,714	- 829	- 5.3
Swine.....	541,290	345,778	+195,518	+56.5

MOROCCO

Horses and mules.....	119,000	173,664	- 54,664	-31.5
Asses.....	420,000	366,495	+ 53,505	+14.6
Oxen.....	1,300,000	1,322,173	- 22,173	- 1.7
Sheep.....	6,600,000	5,079,629	+1,520,371	+29.9
Goats.....	2,000,000	1,628,874	+371,126	+22.8
Swine.....	130,000	127,598	+ 2,402	+ 1.9
Camels.....	86,000	73,513	+ 12,487	+17.0

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